The Canadian
Medical Association Journal

Vol. XXV TORONTO, AUGUST, 1931 No. 2

SOME DIFFICULTIES IN IMMUNIZATION WITH VACCINES*

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I HAVE chosen to speak on the difficulties with which we have to contend in attempting to immunize susceptible individuals with vaccines, because by recognizing our difficulties we are more likely to make progress. But may I preface what I have to say by mentioning certain difficulties with which I have to contend in presenting my subject. To-day immunity is a highly specialized science, and, in order to gain an understanding of its most elementary principles, it is essential to have a good working knowledge of bacteriology and pathology; to have a specialized knowledge of certain branches of physiology, biochemistry and physical chemistry; and, for certain purposes, to have a limited but sound knowledge of zoology and botany. My first difficulty rises out of the fact that I am insufficiently equipped in each of these subjects, and my second is that you are probably no better off.

Immunity means the development of specific properties demonstrable in the tissues and fluids of the animal and plant body in response to the penetration of certain complex foreign substances. This alteration in the properties of the tissues and fluids of the body, which we may speak of as the "immunity response", is recognized by certain characteristic interactions between the altered tissues and fluids of the body and the substance which has been used to induce immunity. It is a common conception that these characteristic interactions are due to a number of distinct and newly formed antibodies, but it is dangerous to hold this view for two reasons: firstly, it is an unsolved question whether antibody formation is a new development or simply the augmentation and perfection of a pre-existing function, designed for another purpose of which we are ignorant and which we only recognize in its application in this form; and secondly, it is probable that various of the well known immunity reactions are different manifestations of a single mechanism.

The substances which call forth the formation of antibodies are spoken of collectively as "antigens", and I wish to emphasize that the distinguishing property of an antigen is its power to *stimulate the production* of antibodies and that it is not admissible to define an antigen simply as a substance which reacts with a specific antibody. Now there are a large number of apparently unrelated substances, varying greatly in their origin, all of which are antigens. Certain of them may of themselves be harmful to animals and others are innocuous, but all are complex in their chemical, physical and biological properties. Those with which I shall deal to-night, because they are those in which you are directly interested, are the bacterial antigens in the form in which they are used as vaccines. They are perhaps the most complicated of all, because they are a mixture of the whole bacterial organism with its secretions and excreta, and very often with the by-products of its action on the nutritive material with which it has been supplied. "Purified" antigens are at present confined to the realms of research in laboratories, but they are yielding important results, certain of which I shall employ to support my remarks to-night.

* Read before the Montreal Medico-Chirurgical Society, April 24, 1931.

THE RECIPIENT

The first important point to realize in considering active immunity is that the immunity response is the product of an interaction between the recipient animal and the antigen, and that, in a general way, neither one is more important than the other. It is true that the recipient animal responds strictly in accordance with the nature and constitution of the antigen, and the results we get do depend largely on the nature of our antigen and what we have done to it, but, in addition, the biological character and the constitution of the recipient animal play an important part. May I draw your attention to two or three factors contributed by the animal, even though I feel your clinical studies of patients in health and disease should give you greater authority than I have to speak on this subject. Animals exhibit a power of selection over the antigens to which they will respond, both in regard to species of animals and as individuals, but it is the individual response which bears most on the problem we are discussing. It is curious to observe the effect of using a mixture of two antigenically distinct bacterial suspensions (Shiga & Flexner), and see certain animals respond more strongly or even solely to the one antigen, while certain other animals of the same species respond to the other antigen in the mixture. It is this factor which is partly responsible for the disappointing results from polyvalent vaccines.

Then, again, there are individuals who respond very poorly, or even hardly at all, to immunization, and this is well known in the experience of producers of therapeutic immune serums. In this same category there are those who fail to establish a satisfactory resistance on recovery from diseases well known to confer immunity on the average individual. These refractory individuals constitute only a small proportion of the population, as do too those of the other extreme who respond amazingly well. But it has yet to be discovered whether this personal inactivity is confined to certain types of antigen only, or whether lack of response to one immunological stimulus indicates an incapacity to respond to all.

In experimental immunity there is ground for suspicion that animals suffering from intercurrent infection give a meagre yield of immune bodies. But this is not sufficient to account entirely for the disappointing results of therapeutic vaccines. For, leaving out of consideration for the moment the question of the antigen, we are confronted with the problems of why anyone suffers a generalized infection with certain organisms, and why patients do not recover when it can be demonstrated that they have developed a very marked antibacterial immunity to the organisms invading them. There is also very suggestive evidence that there exists an hereditable resistance to infection, which is of a non-specific nature and which is accompanied by an unusual tolerance of mineral poisons. These considerations present urgent problems for solution.

I can state all we know of two other important aspects of immunization in very few words. Although there is ample evidence to believe that malnutrition lowers resistance to spontaneous and induced infections, "there is little evidence that nutritional defects disturb the antibody-forming mechanism". But these questions should not be left in this uncertain light, particularly when there are so many who are interested in the problems of nutrition.

Now these observations are sufficient to show that we cannot predict, much less control, the immunity response of the recipient of our vaccines. You may or may not quarrel with me if I express the opinion that the study of these factors, which enable the recipient to respond or which interfere with his immunization, lies within the province of clinical medicine. I believe this to be the contribution clinical medicine should have made to the study of immunity and I submit that it has not done so. It is amply evident that there are considerable and important variations between individuals which contribute to the course run by infections, but that we are woefully ignorant of their nature and action is witnessed by the glib use we all make of such words as "susceptibility" and "resistance".

THE ANTIGEN

Turn now to consider a few of the antigenic variations exhibited by bacteria and something of the attempts which have been made to determine their significance. In the first place, as applied to man, there are limitations set by

considerations of safety which need not interfere in laboratory experiments on animals when the significance of the results justify extreme risks. For this reason there are few methods of immunization of man which employ living viruses to-day. Vaccinia virus is so used; living rabies virus is still used in some places, though the killed virus is employed elsewhere; Calmette's "BCG" is a bold, and, I think, unjustifiable, use of living bacteria as a vaccine. In earlier days men were bolder, modelling their methods on Jenner and on Pasteur; but at times, though not always, their attempts were attended with disaster, as when five out of six persons died after inoculation with living plague material by Coruti in 1824 (before the days of bacteriology); living attenuated *P. pestis* was used by Strong in 1907 because it was the most effective; while others have used living *B. typhosus* and other organisms. Nevertheless, there is strong evidence, apart from Pasteur's work, that the quality of the immunity evoked by the living virus cannot be equalled by any method which substitutes a dead antigen. The truth of this is not confined to the "filterable viruses", it is also evident with bacteria such as *B. œrtrycke*, while with *B. aviseptica* (fowl cholera) it is the common experience that only the living organisms will confer a solid immunity. But this is difficult and dangerous work which will appeal to few, involving the problematical stability of "fixed" attenuation, so I need not tarry longer over it. We are therefore forced back to killed antigens, until our knowledge justifies other means, and here we meet with a multitude of difficulties, due to the alterations produced by the variety of means used to kill and preserve the cultures. In many, perhaps the majority of instances, in making vaccines these influences are lost sight of in the anxiety to be sure the vaccine is dead. It is the usual practice to add disinfectants as a precaution against contamination or as the lethal agent. As a precaution it is justifiable, but the choice of disinfectant and the stage of preparation at which it is added are of considerable importance, else the efficacy of the vaccine is destroyed, as was shown by the German Commission on Plague, and as has been suggested by the study of somatic antigens. I will refrain from technical details; let it suffice to say that the method of killing and the disinfectant used must be selected according to the antigenic property it is desired to emphasize and the identity of the microörganism.

Another important condition to be observed in preparing a vaccine is what is called the "virulence" of the strain used. It is tempting to discuss the meaning of virulence, but time does not permit of it; let it pass as a greater propensity possessed by certain strains of bacteria for a parasitic existence than is shown by others of the same species. The belief is becoming more widely spread that the virulence of the culture used for immunization is of importance, if not with every kind of bacterium, at least with certain of them. For example, it is generally agreed that only strains of the highest virulence must be used in producing anti-pneumococcus serum; not that strains of low virulence will not immunize, but the serum they produce is less effective. Also, in the investigation of plague vaccine it has been demonstrated that the *killed avirulent* organism has no immunizing power and must be avoided in making a vaccine. Therefore, in making this vaccine great care must be exercised in selecting the strain, and, because of its progressive attenuation in the body as immunity develops, it is not sufficient to use a strain which has been recovered from an animal or man without regard to the stage and progress of the infection. This consideration strips the veneer from the cherished idea of autogenous vaccines, made without investigation of the biological properties of the culture. It also raises important questions in relation to the use and making of vaccines for infections such as subacute endocarditis.

There are many aspects of the question of virulence which are important, and with regard to the alterations which take place *in vivo* I shall only say that the fact that a strain has been passaged through an experimental animal or man does not insure a raised virulence. It is, in fact, easier to lower virulence by passage than to raise it, unless certain precautions have been observed.

There is one aspect of virulence I would pause to consider for a moment which concerns its relation to the medium on which the organism is grown, as this has a direct everyday influence on the preparation of vaccines. It is not sufficient to obtain growth, and growth is not necessarily adequate when it is remark-

ably profuse, because the virulence of the culture is independent of the conditions required for reproduction. A few organisms, such as *My. tuberculosis, P. pestis, Cl. œdematis maligni,* maintain their infectivity over long periods in culture, but the majority become attenuated very rapidly when grown on the media ordinarily used; even one subculture is often sufficient to render a strain innocuous. One organism which becomes attenuated very rapidly, and of which the virulence is probably a matter of great importance in immunization, is the meningococcus. Nevertheless, it is not very difficult to make a medium on which this organism will maintain its virulence constant for as long as a year, and this property of the medium depends upon an optimal concentration of certain unidentified products of the tryptic digestion of meat, but this optimal concentration can only be estimated by determining by animal experiments the minimal lethal dose of the growth yielded. To realize the influence of this medium it is only necessary to alternate the transference of a chosen virulent strain of meningococcus between a fully adjusted medium and a medium which is not adjusted, but which is like in other respects, and the growth from one medium will invariably kill, while that from the other will invariably fail. It is possible that special adjustments are necessary for different kinds of organisms, and it is possible that attention to this detail might make a world of difference to a vaccine.

That not every organism requires a high grade of virulence to make an efficient vaccine is illustrated by the remarkable results obtained with the famous "Rawlings" strain of typhoid used in the vaccines made for the armies in the Great War. But let me hasten to assure you that even with the "typhoid-coli" group of organisms the preparation of vaccines is not fool-proof. Consider for a moment the "antigenic analysis" of these organisms, by which it has been shown beyond dispute that they have flagellar antigens and somatic antigens which are immunologically distinct. These have become known as "H" (flagellar) and "O" (somatic), for reasons I need not trouble you with, and, furthermore, each of these types of antigens exhibit two phases: There are the "H-specific" and the "H-group" and there are the "O.S." (smooth) and the "O.R." (rough), (written Φ by some authors). Now the "H" antigens appear to play no part in protective immunization, though they are important in other ways, whereas the "O" antigens are directly concerned with protective immunization and are associated with the virulence and lack virulence of a strain. Virulence is associated with the "O.S." antigen, whereas pure "O.R." strains are not virulent and do not afford protection when used as a vaccine. The conclusion that a vaccine must be made of cultures of the "O.S." type has been amply substantiated by various workers and there is no indication that the other components, with the exception of toxin, have any significance in protective immunization. These important variations are not confined to the "Typhoid-Coli" group; they are equally significant in other bacteria, although endowed with peculiarities which vary according to the kind.

One other interesting point is worth just mentioning. The resemblance between the somatic antigens of widely differing bacterial species is sufficiently close at times to afford some degree of reciprocal protective immunity. This fact explains the noticeable protection which was afforded by typhoid vaccine against paratyphosus A. and paratyphosus B. infection in the war up to January, 1916, when T.A.B. was introduced.

Let us regard this matter in the light of what we have discussed earlier. The different "H" and "O" antigens may be variously combined in a given bacterium and all the "H" and "O" antigens may be variously distributed in any culture. Not only are these antigens differently affected by heat and chemicals applied in the accustomed manner employed in the preparation of vaccines, but their relative distribution in a culture is influenced by the medium and the cultural conditions, and all these factors are commonly neglected in the preparation of vaccines. I cannot emphasize too strongly the importance of the antigenic constitution of a vaccine, and I must deplore the carelessness with which they are usually made; but there is no doubt that this is largely a response to the uncomprehending demand for vaccines and the indiscriminate way they are used.

In passing, I may point out that this knowledge of antigenic structure has a profound effect on the agglutination reaction applied as a

diagnostic test. Widal reactions done by internes, particularly when the "microscopic test" is used, are unreliable. Unless they are performed by men trained in the methods of modern immunology they can well be classed among the amusing recreations for the young.

There are many matters relating to the preparation of vaccines on which there is not time to touch. Discoveries of considerable importance have been made on the antigenic structure of the pneumococcus and various other streptococci, which throw much light on the problems which concern specificity. These are matters which we shall not be able to neglect in the future. There are also the toxins of bacteria, which have no direct relation to the antigenic structure we have already discussed. Then, too, the question of by-products of growth and the residual medium are not without significance. Then the questions of sensitized bacteria and of serum-virus mixtures are of interest and importance. However, I think I have said enough to convince you that a vaccine is not simply a suspension of dead bacteria which have been grown on any medium and killed in any way. I also hope I have shown you that the laboratory workers have made considerable contributions to knowledge in recent years and that the promise of great advances in the future is significant.

THE DOSE

In practice the dose of a vaccine is determined in the first place by considerations of safety, in the second place by the discomfort the patient is likely to tolerate, and last of all by the amount which will provide a sufficient stimulus to induce immunity, but this important consideration has been known to be overridden by unwillingness to provoke dissatisfaction in the patient. No one questions that safety is imperative, but I do suggest that there is no justification for a compromise between an effective dose with discomfort and an ineffective dose without discomfort, when a marked general or local reaction is unavoidable. There is some evidence from animal experiments (Weber), that, with typhoid and cholera, protection varies in proportion to the dose and it has been suggested that small doses temporarily inhibit the site of antibody formation whereas large doses stimulate it to activity. Fortunately some efficient antigens (*e.g.*, cholera) do not give rise to much reaction, but this is not the case with others. With Shiga's dysentery bacillus, for example, it is easily possible to immunize experimental animals with a single dose, to enable them to resist a certain fatal dose injected later; but on account of the severity of the local reaction the dose of Shiga vaccine used on man has been kept down to ineffectual proportions. At the same time there are complicating factors in dysentery which may prove inimical to an active immunization to protect *completely* against infection.

The dose to use in man is one of the uncertainties for which there is urgent need of coordinated investigation by the clinician and the laboratory worker. It can only be determined on man and it has yet to be decided whether a definite rise of temperature, as used by Haffkine, or any other sign or symptom constitutes a reliable guide. The dose used for the T.A.B. vaccine was determined by titrating the immune body production, and, though the experiments were not of the order now required, the decisions reached proved satisfactory; at the same time experiments were made to determine technical procedures which reduced the severity of the reaction without reducing efficacy.

THE ROUTE

In administering a vaccine it is very important to preclude the possibility of alteration in the constitution of the antigen, for it is essential that the antigen gains the tissues and fluids of the body in an unaltered state. There are antigens which will allow of oral administration, but the method is uncertain and usually the response is feeble. The best results are obtained with all antigens when they are brought in direct contact with the tissues and the most suitable parenteral route varies with the type of antigen and the effect desired. Evidence is accumulating, from laboratory experiments, that elective routes exist for certain antigens. For example, the intracutaneous route is most effective for anthrax (Besredka, Bautz), for the Preisz-Nocard bacillus (Ledingham), and probably for certain filterable viruses. But this is yet another matter calling for investigation in man.

GENERAL CONSIDERATIONS

The site of antibody production is still undiscovered, although in certain quarters it is considered to be the much invoked reticulo-

endothelial system. But up to now inexplicable discrepancies have resulted from blockade experiments, and, at most, only temporary arrest of antibody formation is observable when the most complete exclusion of this system is attempted. However, this line of investigation is attracting considerable attention and results one way or the other may be expected as the technique develops. Much depends upon the solution of this problem and not the least of its applications might perhaps be some understanding of the principles upon which the therapeutic use of vaccines must be based.

The nature of immunity is only partially understood, and substantiation of the idea that immune bodies demonstrable in the serum would be directly proportional to the degree of protection has long since failed. This is only in part true of active immunity against toxin, which does provide a high tolerance for toxin but it also leaves a permanent impression, demonstrable by the remarkable response to what Glenny calls a secondary stimulus. The disagreement between the demonstrable immune-body content of the serum and the degree of protection may yet prove to depend upon the immunologically distinct antigens we have considered as constituents of the bacterial cell. If this is the case then titration of the antibody which is induced by the pure antigen which confers protection, may prove a measure of the degree of protection. At the same time it must be remembered that the response to minute secondary stimuli, and the low concentration of demonstrable antibodies of the correct type in animals possessing a well marked degree of protection (O.S. in the case of *B. ærtrycke* infection in mice), suggest that an altered reactivity of the living body cells is not without effect. It may even be that there exists, as suggested by Ledingham, "a state of immunity quite unconnected with antibody response."

Though there are many things related to vaccines upon which I have not even touched, I have said enough for you to see there is yet important work to be done, not only in the laboratory, whence our knowledge of this subject has come up to now, but in the departments of clinical medicine; nevertheless, it is not work to be done carelessly and without control. It is true there have been rumblings of condemnation and pæans of praise from the bedside, but neither have been founded on a critical analysis based on a knowledge of the processes involved, and I do not personally feel that any importance can be attached to the opinions of the 1,500 dissatisfied practising physicians collected by Hektoen and Irons. Everyone knows vaccines are used less now than they were between 1906 and 1912, but that is a great advantage, as very few are now using vaccines for everything they can think of. At the moment there is another rage and it will be replaced in turn by yet another which will catch the fancy and each will be run to death. Vaccines have been tried, the dilettante is becoming exhausted, while others are increasing our understanding, and this leaves me convinced that the greatness of vaccines lies in the future when they will have "lost all that is exuvial" and be made and used with discrimination.

PREVENTION AND CONTROL OF VENEREAL DISEASES.—In discussing the important public health problem of venereal disease, Surgeon-General H. S. Cumming of the Public Health Service invites attention to the fact that during the fiscal year 1930 state health authorities reported to the Public Health Service 213,309 cases of syphilis and 155,875 cases of gonorrhea. The total of venereal infections thus reported exceeded the number of cases reported during the calendar year for any other single communicable disease, omniprevalent measles not excepted. While it may be assumed that the reporting for all notifiable diseases probably is far from complete, there is no reason to believe that cases of venereal disease are being reported any more completely than cases of other diseases. On the other hand, data obtained from prevalence-studies which have been made up to the present time appear to show that the incidence of syphilis and gonorrhea in the United States probably is much higher than that indicated by the state reports. Estimates worked out from the results of these surveys place the probable number of new infections for which treatment is sought during the course of a year at more than 1,000,000. Realizing the serious nature and tremendous extent of the venereal disease problem in this country, the Service has continued its efforts to improve methods of treatment for syphilis and gonorrhea and to stimulate greater interest in the control of these infections. Special surveys have brought to light the true prevalence of syphilis in certain population groups in several states. Demonstration projects, financed almost entirely with funds obtained from outside philanthropic agencies and from state and local sources, have been carried out under Service guidance to show what may be accomplished in the control of syphilis through the effect of treatment applied to large numbers of infected individuals in a single locality at one time.—*The Diplomate*, 1931, **3**: 22.

BLOOD CULTURES AND FOCAL INFECTIONS: AN EXPERIMENTAL STUDY WITH ONE HUNDRED HEALTHY ADULTS*

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THE fact that the blood-stream of the healthy animal is normally free of bacteria is such a fundamental in our concept of infection that we accept it with little more than a passing thought. It is noteworthy, however, that records of studies to establish this fact are very difficult to find. Our assumption is based upon the observation that in ordinary practice we obtain many negative cultures of blood and when we do encounter positive cultures they are usually of serious import. There is much evidence, however, to indicate that pathogenic organisms do invade the blood-stream without necessarily inciting disaster and without the production of significant symptoms. It is felt that one of the most definite indications of this is the frequent occurrence of suppurative osteomyelitis from which staphylococci are obtained and which could only result from hæmatogenous infection. Also, the not infrequent experience of finding staphylococci or similar micrococci in blood cultured in hospital laboratory practice leaves one in doubt as to whether these organisms are contaminants or potential pathogens. Then too, one encounters other organisms variously described as "diphtheroids" and "pleomorphic non-hæmolytic streptococci" which do not incite disease of serious import.

In view of these considerations it was felt that information might be obtained by performing blood cultures on a large group of people who were in good health. This report therefore conveys the findings of such an experiment carried out upon one hundred students of the Faculty of Dentistry, University of Toronto, who volunteered to submit themselves for blood culture. These subjects were all young men aged from 20 to 26 years. An interrogation regarding the present health and previous experience of disease was conducted and an inspection of the nose, throat and ears of each was carried out, as well as a detailed examination of the teeth, which included complete x-rays. Complete physical examinations were not made, as it was felt they would be superfluous in view of the uniformly good histories, but as the cultures were made in March, 1930, a time of year when infection of the accessory nasal sinuses was exceedingly prevalent, these common foci, as well as the apices of the teeth, were examined in detail.

For the sake of uniformity in the investigation the culture medium was all pooled before its final titration, and the blood cultures, and ear, nose and throat inspections were all performed on the same day. The dental inspection was carried out during the succeeding month.

TECHNIQUE

Culture medium.—This was a beef heart infusion broth made by extracting 500 g. of minced heart in 1 litre of tap water. The extracts were obtained by siphon. No filtering was applied. One per cent of peptone and 0.5 per cent NaCl were added and the several batches of extract were pooled in a large pot before adjusting to pH 7.8 and transferring in approximately 180 c.c. amounts to eight ounce medicine bottles for sterilization at 15 lbs. steam pressure for 15 minutes.

Blood samples.—These were taken in 20 c.c. amounts from veins over the antecubital fossa through skin flooded with 95 per cent alcohol. The syringes were boiled, with the needles applied, for three minutes and used as soon as they were cool enough to handle. The blood was obtained without anticoagulant and was immediately transferred to the bottles of broth, to make approximately 1-10 dilutions.

Dental inspection.—This work was facilitated by the fact that the subjects were practically all students of the two senior years. Histories, therefore, of the period of devitalization, for example, of teeth were reliable. Every tooth was examined in detail and disease or abnormality was recorded on chart forms. The

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inspection was supplemented by complete x-rays in order that latent or symptomless apical infections might be disclosed.

Ear, nose and throat inspection.—Each subject was given a moderately careful examination of the ear, the nose, accessory nasal sinuses and the throat. This examination was carried out in a dark room where transillumination was possible and where every facility for a complete investigation was available. Before the examination was instituted each was interrogated as to history which might suggest chronic inflammation of the ears or upper respiratory tract. Such suggestive history called for careful inspection of the suspected area as well as the routine inspection of the complete field. Any purulent discharges, variations in transillumination, or cervical adenitis which were noted in the examination were carefully recorded as potential foci of infection.

Bacteriological examination.—The non-absorbent cotton plugs of the bottles were covered with paraffined paper which was held in position with rubber bands and the cultures were inspected daily but were left unopened for two weeks. At this time films were examined and subcultures made on the surface of blood agar plates. Incubation was continued and the same procedure of examination was performed two weeks later before discarding the cultures.

RESULTS

It was felt at the outset, of course, that most of the culture results would be negative and that as no practicable technique is invariably dependable the significance of positive cultures would have to be appraised, *i.e.*, the decision as to whether these organisms were obtained from the blood-stream or were contaminants would be determined by probabilities rather than certainties.

Of 100 cultures 81 remained negative and the discussion must centre about the remaining 19. Twelve of these were indisputably contaminants. The organism was in all cases a spore-bearing bacillus which formed a heavy pellicle in the bottles. This growth was apparent after about two days' incubation. It was thought that these were probably glassware contaminants, as our sterilizing facilities were somewhat overtaxed in the process of preparing all the media in one lot. Incubation of these cultures was continued, however, in the belief that the presence of these organisms would not necessarily inhibit the growth of other organisms which might be in the blood-stream. As no other growth was obtained, and it was proved that commensal growth of these bacilli with organisms which we believe originated in the blood-stream was possible, these cultures are included with the 81 to make a total of 93 negatives. Of the remaining 7 one was probably an airborne contaminant. It was a Gram-positive coccus but of more luxuriant growth and of a different colour from *S. aureus.* It first appeared after four days' incubation. This leaves 6 cultures which it is our belief were obtained from the blood.

Of these six, 4 were characteristic *S. aureus.* The time of their appearance in numbers sufficient to be recognized was indefinite, but the indication of their presence was evident at six days, though the flasks were not opened until a week later. Three of these four cultures remained alive and uncontaminated during the month of incubation, though one was found to have died out when the subcultures were made just prior to discarding.

Of the two remaining positive cultures one was detected at the two-week subculture, and the other did not appear at that time but was found at the end of the month. Elaborate procedures to identify these organisms were not performed, but morphologically they were identical and they could be safely grouped with the "diphtheroids". Their presence in the flasks was not suspected before sub-culturing, as hæmolysis, which was general even in the negative cultures, masked the cloudiness. The films from the blood cultures disclosed minute forms which were definitely bacillary rather than coccoid in outline. The arrangement was in groups rather than chains. The staining affinity was Gram-positive. Aerobic growth on the surface of blood agar was copious in twenty-four hours and Loeffler's serum medium did not appear to be more suitable. Methylene-blue staining disclosed slight pleomorphism but no metachromatism. Spore-bearing properties and motility were not present.

With a view to investigating whether those who yielded positive cultures were constant harborers of organisms in their blood-streams new cultures were made, about six weeks after

the first, from the four who had yielded staphylococci and the two who had yielded diphtheroids. The same technique and media were employed as in the former cultures. These cultures all remained negative for a month.

A detailed analysis of the presence or absence of lesions disclosed by the examination of the teeth, ear, nose and throat will not be presented in this report, but a summary is requisite to the consideration of the matter under investigation.

Regarding the teeth, there was of course no badly neglected mouth, and caries, where present, had received attention. Faulty occlusion of varying degree was common, as were also non-vital teeth. These abnormalities, as well as slight indications of gingivitis, were not regarded seriously as potential foci. There were, however, 25 cases where x-ray revealed apical disease in from one to four teeth. This was not extensive in any instance but was sufficiently definite to permit precise opinion. It is to be noted that the positive cultures did not come from this group and the dental charts of those who showed positive cultures were all relatively normal.

The ear, nose and throat examination disclosed much that was a sufficient departure from normal to be worthy of note. There were only 18 of the hundred subjects who were quite free of some evidence of inflammation. In two only were the ears involved and these two had chronic suppurative lesions of the middle ear or mastoid cells. Their blood cultures were negative. The other lesions ranged from opacities of the antra to definite subacute tonsillitis, and in many there coexisted opaque antra, mild purulent rhinitis, and pharyngeal engorgement. The interpretation of the meaning of hazy antra is in many cases speculative, but in 60 subjects were found the stigmata of previous or present inflammation — enlarged cervical lymph nodes. One of the subjects who yielded a culture of *S. aureus* had a mucopurulent discharge from the right nostril, partial right nasal obstruction, a dim right antrum, enlarged tonsils and enlarged cervical lymph nodes. The others were free of abnormalities which might be interpreted as disease.

DISCUSSION

As each of the cultures in this group was necessarily an "experiment" and the employment of "controls" was not possible, conclusions must take cognizance of the controversy as to the source of organisms developing in blood cultures of well people. The fact that we encountered definite contaminants leaves our results open to the criticism that all of our positive cultures had a comparable source. However the fact that the admitted contaminants were all of the same type, prolific spore-bearing bacilli, would make it reasonable to conclude that these were survivors in the glassware; it is unlikely that the cocci and bacilli obtained in the other positive cultures could escape the destructive action of the heat. The facilities for securing the blood samples were better than are frequently available when working at the bed-side. Trained and carefully instructed assistants participated in the procedure and there was no reason to suspect imperfect technique on their part. We did not encounter technical difficulty in securing the blood in any instance. The needles and syringes were carefully selected and the veins were all easily accessible. Only in two or three instances was it necessary to make a second perforation of the skin to enter a vein. The needles were all removed from the syringes with flamed forceps before the blood was expelled and the nipple of the syringe was flamed in all cases. There were a few instances where air entered the syringe about the shank of the needle as the blood was obtained, but these cultures were designated and all remained sterile.

The technique of culturing the blood which we applied may be subject to adverse criticism as being inadequate to assure the growth of the more dependent parasitic organisms such as the streptococci which have been recovered from the blood of arthritic patients. Cecil, Nicholls and Stainsby[1] review this aspect of the subject adequately, and describe an adaptation of the technique of Clawson[2] which they applied in their investigation. Their method was, in substance, to divide the blood into two samples, in order to control contamination, and to separate clot from serum in a centrifuge. The serum was then discarded with a pipette and the clot after being broken up was transferred to nutrient broth for culture. In adopting such a method one is getting rid of the major part of the serum with its alleged inhibiting influences and jeopardizing the asepsis of the procedure by greatly increasing the manipulation. In

our investigation we had to appraise the possible benefits of such a time-consuming method against the desirability of obtaining all of the blood samples on the same day. We were influenced to decide in favour of the simpler procedure by the assumption that inhibitive influences in serum are probably largely eliminated by dilution and our broth-blood ratio was 9:1. Then again, as these effects are probably "bacteriostatic" rather than bactericidal, prolonged incubation would probably entirely neutralize any inhibitive influence that survived the dilution.

Reasoning from the common clinical experience that suppurative lesions develop at the site of deep injury in previously vigorous and presumably healthy people it is not too presumptuous to conclude that our 4 staphylococcus and 2 diphtheroid cultures were instances in which we obtained samples actually at a time when the blood-stream was transporting organisms. In support of this it was discovered that two of the subjects who yielded staphylococci had at the time pustular acne on the back. In one other rhinitis, tonsillitis and cervical adenitis was present. The others were apparently free of disease.

SUMMARY

Experimental blood cultures were performed on 100 well subjects.

Uniformity of experimental conditions was attained by obtaining all of the blood samples on the same day and using one lot of medium.

The ears, upper respiratory tract and teeth were carefully searched for foci.

Six positive cultures were obtained, 4 *S. aureus* and 2 *diphtheroids*.

The positive cultures did not arise from subjects in whom were found foci of the ears, teeth or nose and throat which might justify a suspicion of blood stream infection.

CONCLUSION

Six per cent of well people may at any time carry potentially pathogenic bacteria in their blood.

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An Address

ON

THE FACTORS REGULATING THE COMPOSITION OF THE GASTRIC JUICE*

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IN the physiology of digestion it is a well established fact that the various food substances activate secretions of gastric juice of different composition. The variations in the acidity and peptic power and in the concentration of organic matter in the juice occur in many instances independently of the rate of secretion. These variations may be accounted for by the participation of two distinct mechanisms regulating the activity of the gastric glands. The "nervous mechanism", represented by parasympathetic nerves, has the property of stimulating a flow of highly acid juice, rich in pepsin and organic matter. The "humoral mechanism", which comprises the so-called "pyloric" and "intestinal chemical" phases of the gastric secretion, produces a gastric juice of high acidity but containing a smaller amount of enzymes and organic matter than that activated by the nerves. In addition to this, certain substances, such as fat, for example, inhibit the production of the fluid parts as well as of pepsin in the gastric juice. From these considerations the variations in the composition of the gastric juice under different circumstances may be understood. Every meal first activates the "nervous phase" of the gastric secretion, which will differ in strength

* An address delivered at the meeting of the New York Academy of Medicine, April 2, 1931.

according to the properties of the food ingested and the condition (hunger or satiety) of the animal. Later, this is replaced by the "chemical phase". The balance of the action of positive and negative secretory stimuli during this phase determines the course of the gastric secretion and its composition in the second part of the digestive period.

The intimate mechanism whereby the gastric glands elaborate a secretion of varying quality is, however, not yet clear. The usual basis of explanation of analogous phenomena in the different digestive glands is Heidenhain's well known theory of "secretory" and "trophic" nerves. Since Heidenhain's time a humoral mechanism, activating the secretion of many glands, has been discovered, so that it would be more correct to speak of the theory of "secretory" and "trophic" impulses conveyed through the nerves or through the blood. According to Heidenhain, under the influence of the secretory impulses the glandular cells secrete the liquid parts of the juice and the inorganic salts, whereas under the influence of the trophic impulses they supply the secretion with organic material and enzymes. This theory met with opposition from several quarters (Langley and Fletcher,[1] Carlson,[2] Babkin[3]). However, there are not yet sufficient grounds for rejecting it altogether, as in many cases this theory offers the only explanation of certain phenomena observed in connection with the digestive glands. During the last few years data have been accumulated in our laboratory which could not be reconciled with Heidenhain's theory. Some other explanation of these facts was therefore sought.

The first question which arises, in considering the composition of the gastric juice, is the part played by the different cytological elements constituting the gastric mucosa in the elaboration of the various parts of the secretion. There are at least four different groups of cells in the gastric mucosa which participate in the formation of the gastric juice: (1) mucous cells of the surface epithelium; (2) chief cells of the neck, or mucoid cells; (3) peptic cells; and (4) parietal cells. Our present knowledge allows us to ascribe the elaboration of some of the chief constituents of the gastric juice to the different cytological elements of the gastric mucosa. Thus mucin is secreted by the surface epithelium and appears in the juice in the form of lumps and threads of mucus. The granular content of the peptic and chief cells and its diminution during secretion suggests that these cells have relation to the production of pepsin combined in some way with a protein-like substance. There is strong evidence in favour of the view that the parietal cells elaborate a solution of hydrochloric acid or its components. To these constituents of the gastric juice must be added one more compound—dissolved muco-protein. This muco-protein, not previously identified, was found to be present in variable amount in different samples of dog's gastric juice (Webster and Komarov[4]). Being obtained from pure filtered gastric juice produced by different methods in dogs with œsophagotomy and gastric fistulæ or with various gastric pouches, it showed a remarkable constancy of composition. It contained 13.7 to 13.9 per cent N and 0.25 per cent SO_4, as organic sulphates, and a very low ash percentage, 0.15 to 0.2 per cent. On hydrolysis it gave a strong reduction; calculated on glucose it was equal on the average to 12.8 per cent. We do not state that the gluco-protein-like material precipitated from the gastric juice is a pure chemical substance. It may be that there are several proteins in the gastric juice which are precipitated by acetic acid after neutralization or by acetone. However, it is very suggestive that by different methods several chemical preparations were obtained which on elementary analysis gave the same result. Thus there is no doubt that in pure gastric juice a gluco-protein is present in a dissolved state.

The source of the dissolved mucus is not yet entirely clear. The surface epithelium mucus may be partly dissolved. There is, however, reason to believe that dissolved mucus originates from the peptic glands. Thus, when mucus in flakes and lumps was collected from a dog with œsophagotomy and a gastric fistula, which during five to six hours secreted only small amounts of alkaline fluid containing flakes of mucus, as is usually the case in dogs when the gastric mucosa has not been activated in any way, it was found that it differed in composition from dissolved mucus. The nitrogen content of the surface epithelium mucus, calculated on an ash-free substance, was 12.51 per cent;

its ash amounted to 2 per cent; and its reduction power after hydrolysis corresponded on the average to 30 per cent of glucose (Webster and Komarov[4]). A further indication that dissolved mucus is secreted by the gastric glands may be found in the fact that under certain stimulation, *e.g.*, activity of the secretory nerves, as will be shown later, its concentration in the gastric juice is increased. This very often occurs independently of the rate of secretion. The exact source of the dissolved muco-protein is not yet established, but it may be that it is produced by the mucoid cells and the peptic (chief) cells.

It is therefore very probable that the different constituents of the gastric juice are supplied by different cytological groups forming the gastric mucosa. In this connection it may be asked—*How is the working of these different histological groups regulated during secretion?* This question may be subdivided as follows. (1) Do the nervous and humoral mechanisms activate the same cellular groups; or are they specially related to different parts of the gastric gland? (2) Are the impulses transmitted by these mechanisms to the glandular cells of constant or of variable character? (3) Do the cells always exhibit the same reaction in response to stimulation? As a result of our investigation some approach was made to a solution of these problems.

First the *nervous phase of the gastric secretion* will be discussed. The gastric juice in this phase possesses a high acidity, very great digestive power, and a high concentration of organic substance and nitrogen. In the dog the acidity of the "nervous" (sham-feeding) juice is slightly higher than that of the juice activated by histamine or alcohol, independently of the rate of secretion (Webster[5]).

At least two kinds of impulses may descend along the vagi nerves to the gastric mucosa. By applying a weak rhythmic electric stimulation to the vagus in the neck of a dog, Vineberg[6] obtained a flow of alkaline, neutral or very weakly acid mucus. On being acidified this mucus showed a moderate peptic power. Special experiments showed that it was secreted not only by the pyloric part of the stomach but also by the fundic part. Since it possessed a certain digestive power, its origin cannot have been derived from the surface epithelium only. A strong stimulation of the vagus produced a copious flow of regular gastric juice with a very high acidity and enormous digestive power. Very little visible mucus was intermixed with this kind of juice. The simplest, but perhaps not the only possible, explanation of these facts is that in the vagus nerve there are at least two sets of nerve fibres which are each related to different secretory elements in the gastric mucosa. In this connection it is worth while to remember that among the parasympathico-mimetic drugs there are some which stimulate selectively certain cytological groups in the gastric mucous membrane. Thus pilocarpine activates chiefly the production of pepsin and organic substances in the gastric secretion. In a much lesser degree it stimulates the production of the liquid parts of the juice and of hydrochloric acid (Churilov,[7] Zitovitch[8]).

In summing up the data concerning the parasympathetic nervous system in its relation to the gastric glands, it may be said that the parasympathetic nervous system activates all the known histological elements forming these glands. That a second humoral mechanism is necessary is because the "nervous" phase of the gastric secretion is of comparatively short duration and cannot supply all the juice required for gastric digestion.

It has long been known that the concentration of pepsin in the gastric juice in the *"chemical" or "humoral" phase of the gastric secretion* is about two and one-half times less than in the "nervous" phase. Webster[9] demonstrated that the "humoral" juice not only possesses a smaller digestive power but contains less organic substance and nitrogen than the "nervous" juice. The gastric juice secreted on histamine is specially poor in organic constituents and nitrogen (Babkin,[10] Vineberg and Babkin[11]). Repeated subcutaneous injections of 1 mg. of histamine, in spite of very great variation in the volume of the secretion, gave a juice with rapidly falling digestive power and nitrogen concentration. Only at the end of the secretory period did the above-named constituents of the juice approach the initial level (Webster[12]). Webster obtained analogous results in a dog with a very large Heidenhain pouch, in which a very few vagus fibres were retained, reaching the pouch probably along the blood vessels. The introduction of certain chemical substances, such as the

extractive substances of meat, alcohol, etc., directly into the stomach through the gastric fistula, activated a flow of gastric juice with diminishing digestive power and nitrogen concentration. Moreover, a meal of meat, or of bread and milk combined, gave practically analogous results. The positive nervous effect produced by the act of ingestion of food was very insignificant and of short duration in this pouch.

A few figures from one experiment (January 22) on this dog will serve to illustrate these relations. The secretion from the Heidenhain pouch was noted every 30 minutes. The free acidity varied in different samples from 0.40 to 0.52 per cent HCl, and the total acidity from 0.42 to 0.56 per cent. First 200 c.c. of 10 per cent alcohol were introduced into the stomach, and one and one-half hours later 200 g. raw minced meat were fed to the dog. The digestive power was determined by Mett's method with the modification of Hawk and Bergeim.[13]

Volume in c.c.:	4.0*	5.0	3.3	3.9†	7.5	13.5	10.4
Total N mg per cent:	36.4	14.0	14.0	22.4	16.8	11.2	11.2
Mett mm.:	608	84	77	105	51	51	19

* 200 c.c. of 10 per cent alcohol introduced into the stomach.
† 200 g. meat fed at the beginning of this half hour.

In formulating the effects of humoral stimuli on the gastric glands it would be legitimate to say that they activate chiefly the secretion of fluid and the production of hydrochloric acid, together with some other inorganic constituents of the juice. Their power to stimulate the secretion of organic substances and enzymes is limited. Some of them, such as histamine, which is probably something more than merely a drug stimulating the gastric glands, seem to be altogether devoid of this property (Vineberg and Babkin,[11] Gilman and Cowgill[14]). The rôle of histamine in relation to the organic substances and enzymes of the juice might be described as a "washing out" process, the mechanism of which is not yet clear.

The most striking results were obtained by the superposition of the nervous stimulus on the humoral stimulus (Webster[12]). A dog with œsophagotomy and a gastric fistula received a subcutaneous injection of 0.5 mg. of histamine. As usual the acidity and chlorine concentration of the secreted juice were high, whereas the digestive power and the concentration of nitrogen, organic substances and dissolved muco-protein were very low. Three minutes' sham-feeding with meat, however, changed the whole picture entirely. Not only did the secretion rise in volume but for a time almost all the constituents of the juice appeared in greater concentration. In the acidity and chlorine concentration, however, very little change was observed. If the total output of the different constituents of the juice during a 5-minute period is compared in the case of the secretions from histamine and after sham-feeding, very remarkable relations may be observed between the organic material and the dissolved muco-protein of the juice. Whereas, under the influence of histamine the amount of both substances determined in the juice was practically the same, after sham-feeding the difference in their concentration was so great that at the height of the secretion the total amount of organic material was almost twice as great as that of the dissolved mucin. In other words, the organic substance of the "histamine" juice was represented almost totally by the dissolved mucin. The nervous stimulus not only increased the output of the latter substance but activated even more powerfully the discharge of some other organic compounds, the nature of which we do not exactly know.

Exp. February 27.—Dog with œsophagotomy and gastric fistula. Total output in 5-minute periods.

Secretion in c.c.:	1.9	2.5*	7.0	4.7	12.3†	25.5	13.5	12.5
Organic substances in mg.:	4.0	2.5	5.6	3.8	29.5	57.2	32.4	12.3
Dissolved mucin in mg.:	4.1	2.7	5.4	4.1	19.6	33.7	16.9	11.6

* 0.5 mg. histamine injected subcutaneously.
† 3 minutes' sham-feeding with meat.

From the data reported above the following conclusions may be drawn.

DISCUSSION

1. The secretion of gastric juice in the dog is intermittent. Between meals, when no stimuli (conditioned reflexes, chemical stimuli from the pylorus or small intestine, etc.) are acting on the gastric glands, no flow of acid juice is noticeable. The reaction of the whole mucous membrane of the stomach, or gastric pouch, becomes alkaline. There is, however, a continuous output of alkaline mucus, which is especially marked during the period of hunger contractions. This mucus on being dissolved

in acid may possess peptic power. The most probable explanation of this fact is that the formation of granules containing enzymes in the peptic cells is a continuous process. When accumulated in the cells in excessive numbers they are automatically discharged into the lumen of the gland. It is for this reason that the first samples of every secretion (gastric, salivary, pancreatic), independently of the character of the stimulation, are rich in organic matter and enzymes. This is also the case towards the end of the secretion period, when the flow of juice diminishes and its digestive power is increasing. In addition, the gastric mucus may be contaminated with pepsin from the pyloric secretion, which has a more or less continuous character.

2. The parasympathetic nervous system has the power of activating different secretory elements of the gastric mucosa, chiefly mucous and mucoid cells in one case, and peptic and parietal cells in another.

3. Humoral (chemical) stimuli chiefly activate the secretion of the fluid parts of the juice and the production of hydrochloric acid. The discharge of organic substances and enzymes from the cells under their influence is very restricted. It is possible that different chemical stimuli may have a somewhat different effect on the gastric glands.

From a consideration of these facts the following theory regarding the activity of the gastric glands may be established. *The qualitative changes in the gastric juice under different conditions of secretion are chiefly due to the unequal quantitative activity of the different groups of glandular cells constituting the gastric mucous membrane.* The relative concentration of the constituents of the gastric juice depends on the participation of the various mechanisms —nervous or humoral — stimulating different parts of the gland.

No definite answer can be given at present to the second question: *"Are the impulses which are transmitted by the nervous and humoral mechanisms to the glandular cells of a constant or a variable character?"* As stated above, when the vagus nerve is stimulated, the strength of the stimulation has a direct effect on the composition of the gastric secretion activated. This may be due, however, to the presence in the vagus of different nerve fibres which have relation to various secretory elements. It is easier to approach the problem of the unequal influence of different chemical substances which activate the gastric secretion. It has previously been shown (Lobasov,[15] Lönnquist[16]) that certain chemical stimuli, such as extractive substances of meat, products of peptic digestion, NaCl solutions in different concentrations, and so on, cause variations in the digestive power of the gastric juice independently of the rate of secretion. Recently it was found that histamine is a substance which stimulates almost exclusively the production of the liquid parts of the juice and of HCl (Vineberg and Babkin,[11] Gilman and Cowgill[14]). This problem is now in the course of reinvestigation in our laboratory.

There is now some indication that the third and most difficult question can be successfully investigated: *"Do the cells always react in the same way to given stimuli?"* We here become involved in the much debated problem of "secretory" and "trophic" impulses and their divergence. From what has been said above, it is clear that in most cases the variations in the composition of the gastric juice may be explained by the unequal activity of the different cellular groups. Hence there is no need to have recourse to the theory of "secretory" and "trophic" impulses. However, when we are dealing with the activity of a single group of secretory elements, the relations are far more complicated. If the secretory cells are subject to the "all or none law", *i.e.*, that they produce either a maximum of secretion or none, then the greater effect of a stronger stimulus may be explained by the greater number of glandular cells involved in the secretory process. It seems probable that the parietal cells are subject to the "all or none" law. Their work is intermittent, which is a necessary condition of this law; they always secrete a hydrochloric acid solution of the same concentration, the amount secreted only varying with the character of the stimulation.

Tempting as it is, such a simplified conception of the process of secretion could hardly be applied at present to the glandular cells of the merocrine type which discharge their zymogen granules into the secretion. It has been shown (Babkin, Rubaschkin and

Sawitsch[17]) that under the influence of different stimuli such cells, as *e.g.*, the pancreatic acinous cells, may in a given period of time discharge their granules at quite a different rate, while the volume of the secretion remains the same. Correspondingly, in one case the juice will be poor in organic substances and enzymes, and in another case it will be well supplied with them. (Compare the different effect of intraduodenal injections of a solution of hydrochloric acid and of sodium oleate on the pancreatic secretion in a dog.) This is an example of the "trophic" influence of different stimuli on one and the same secretory cell, in the true sense of the word "trophic" as used by Heidenhain. Future work will show how far the "all or none" law may be applied to the merocrine cells discharging granules. At present we have to be satisfied with a somewhat vague conception of "trophic impulses."

A selective partial inhibition of the "trophic" influence of the vagi can be demonstrated in the gastric glands (Webster[12]). In a dog with œsophagotomy and gastric fistula, 50 c.c. of olive oil were introduced into the stomach. In one hour the remnant of the oil was removed from the stomach, and half an hour later 5 minutes' sham-feeding with meat was performed. In the accompanying table the total volume of secretion during two hours and the average figures for the different constituents of the juice are compared with the data from a control sham-feeding experiment.

	Time hrs.	*Total vol. c.c.*	*Free HCl per cent*	*Total HCl per cent*	*Total Cl mg. per cent*	*Total N mg. per cent*	*Mett units mm.*
Experiment February 10th after oil	2	195.0	0.461	0.484	563	22.8	110
Experiment February 18th control	2	170.5	0.564	0.583	619	33.2	379

Thus the oil, as an inhibitory agent, very markedly weakened the "trophic" impulses, especially in relation to the enzyme-producing cells, but did not interfere with the transmission of the "secretory" impulses.

What is the practical application of all these data? First, the investigation of the secretory action of different agents led to a better understanding of the secretory effect produced by histamine. This is the more important because histamine is very often used clinically as a gastric test. This drug, however, stimulates almost exclusively the glandular elements producing hydrochloric acid solution (Babkin,[10] Vineberg and Babkin,[11] Gilman and Cowgill[14]). Therefore the histamine gastric secretion does not give a true picture of the total activity of the gastric glands.

A second problem of practical value, arising from the study of the intimate mechanism of the gastric secretion, is the part played by mucus, both visible and dissolved, in protecting the gastric mucosa from injury in general and from ulceration in particular. Very little is known concerning the rôle of gastric mucus, and it would be very desirable to investigate this problem both in normal man and in patients with gastric lesions. The aim of such an investigation should not be merely to add yet another to the dozen already existing theories on the formation of gastric ulcers, but to determine the part played by such easily controllable factors as visible and dissolved mucin in different pathological cases.

CONCLUSION

The qualitative changes in the gastric juice under different secretory conditions are chiefly due to the unequal quantitative activity of the different groups of glandular cells constituting the gastric mucous membrane.

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SOME SIMPLE PSYCHIATRIC CONCEPTIONS*

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II

WE have so far considered some factors which may cause a patient to try to escape from the world by means of a mental illness. It now remains to consider how, in what manner and by what means, an individual arrives at this refuge of insanity. In considering this problem a few conceptions have been formulated which may help us, but I must repeat what was said at the beginning; these, in common with those already advanced, do not adequately explain all the facts and they may in part contain certain inaccuracies, but meanwhile they are of value until more light can be shed on the whole problem.

Life surveyed through coldly logical glasses becomes a somewhat dreary spectacle. Such a viewpoint only shows life struggling upward from its small beginnings; it reveals a grim ruthless conflict, with strength and adaptability its only gods, and the survival of the fittest its only law. Vainly do we search the intertidal ooze from which we sprang for any indication of the earliest beginnings of justice, mercy, and a desire for truth,—in the ages to develop into the numerous philosophies and religions, with ideals which supply to many a meaning and purpose for life,— which make life worth living.

But there is another, a simpler, more fundamental way in which we escape a too logical contemplation of facts. Certain mental mechanisms seem to be inherent in us, which as it were form a mental skin by means of which we one and all shut out, or at least blunt, the perception of facts which otherwise would give us a great deal of pain. In other words there are good grounds to believe that we have within us quite normal and necessary mechanisms which even in a state of mental health allow us to escape by illogical methods a great deal of mental stress and anxiety. "Kidding ourselves" is a slang expression with a good deal of truth in it. Now if we conceive many forms of insanity as an escape from stress it is allowable to think that this escape may in some degree at least be made possible by an extension of these very necessary and useful mechanisms beyond the bounds of normal sane thinking.*

As children we at times secured relief from a too cold world by what is known as the mechanism of phantasy, or wish fulfilment as it is often known, and many of us never outgrow it. "Building castles in Spain" is something we all do at times. The mechanism can be seen operating at every theatre, every athletic contest. Watch the young fan and see how he identifies himself with his hero of the ice or diamond. The sallow, poorly dressed shop girl becomes for a time the beautiful heroine of the screen. It is to her the prince kneels, for her the lights shine, for her the audience gives its plaudits. I fancy all of us have at times allowed ourselves to linger in the house of phantasy where for a few short moments our wildest ambitions have been realized and this workaday world has become perilously unreal.

Up to this point we can go with safety, but the danger line is passed when we find ourselves unable to distinguish the reality from the phantasy. In illustration of this I pick the following case at random from our wards.

Miss X., a woman of 35, at 12 years of age lost her mother and had ever since kept house for her father who is now 75; she did not secure any education beyond that given in a common school, but grew up bright, intelligent, good looking, and showed a marked bent for amateur plays and acting. She was a good dancer and singer, a good housekeeper and hostess, and was very fond of bridge. She was very sensitive and easily hurt, and was often known to worry over the fact that she had no special training and no profession. At the age of 35 she suddenly began to act strangely, became excited, disturbed, noisy, and had to be removed to the hospital where she threw things about and was very violent and destructive. In this phase the patient was diagnosed as a case of mania, in other words she was

* The first part of this paper will be found in the July number of the *Journal*, page 48.

* A clear exposition of many of these mechanisms can be found in "The Psychology of Insanity", by Bernard Hart. (The Macmillan Company.)

seeking relief from the contemplation of a dreary future (and quite possibly other stresses of which we will never learn) by a fugue of excitement. This means is of course inefficient and we expected her to get better. She did indeed soon quiet down and made a partial readjustment, but before long it was seen that the patient was taking a more efficient road of escape towards the closed side of the picture. She gradually lost contact with reality. She would dance and sing, strike dramatic attitudes, listen, smile, bow graciously to unseen audiences, and then repeat the performance. She developed a fancy for one of the doctors, would lay her head whenever possible upon his shoulder, and call him by the name of one of her former men friends. A few weeks later she began to practise masturbation. After months of strenuous effort on the part of nurses and vocational teachers she regained a partial contact with reality and was allowed to leave the hospital on trial. The former condition soon reasserted itself however, and she was returned, again out of touch with reality, and in addition symptoms had appeared which indicated the abnormal operation of still other mechanisms, which with others will be taken up presently in the text.

Another mechanism which adds greatly to our peace of mind is the way in which we can allow our emotions to direct our thinking; we can and do succeed in shutting from our mind the logical consequences of any given line of action, simply because it may be disagreeable to contemplate. Before the war when nations were piling armament upon armament, how often did we hear people say "There cannot be a world war; it would be *too terrible.*" Millions of people refused to allow themselves to contemplate for one moment the logical fact that these great armaments were created to cause death and destruction, and even when the war began we were all sure it would be over in a few months. Even to-day we find people refusing to accept as true certain books and pictures depicting the bald facts of war, simply because such an acceptance would hurt their feelings too greatly. We read of all the nameless horrors of war, and feel that such things can never happen again. Certainly we feel that they can never happen to us, but we never stop to think that while the people of Europe felt precisely the same thing this feeling did not stop the course of events.

The spendthrift is sure something will turn up. He does not even allow himself to think that he will almost certainly have to live in a more modest manner. As to his actually being cold and hungry, although he accepts these facts for others who have no money he cannot accept them for himself. Every teacher knows the parent who is perfectly sure her Willie is never to blame. He may be always in trouble; behind his age in classes, a frequent visitor at the juvenile court, yet these facts will never prove to her that her son is not as perfect as other children. We are all fairly sure we will live to a ripe old age. None of us believe we will die in agony or end our days in a poor house. None of us believe that accident will suddenly cut short our days or cripple us, yet some of these things or others equally as bad will happen to a goodly percentage of people now living.

It is quite right and proper to maintain this attitude in life. A too logical weighing of the facts and probabilities would render life not worth living, but we often go too far and then the world calls us crazy. The mother who stedfastly maintains that her child is not dead, that he has only gone on a visit; the wife who maintains that her soldier husband has not been killed but is being unjustly held in the army, are two rather common examples seen on our hospital wards.

The people who allow their emotions to direct their thinking nearly always use still another mechanism to buttress up their illogical feelings, *viz.*, rationalization. Rationalization is an illogical form of reasoning in order to substantiate some belief which we must retain or otherwise suffer emotional distress. The mother explains her daughter's absence by saying that she has gone on a visit, or that she has been abducted; a few months later she may discover the reason for the abduction, *viz.*, the daughter is an heiress, her patrimony is being held by others, etc. The soldier's widow buttresses her refusal to believe that her husband has been killed by the fact that a letter from him arrived after the official notice of his death.

These examples are distinctly past the verge of sanity. But what about the inefficient office clerk who will not believe that his non-success is due to his own failings, but is absolutely sure that the fact he has not received his promotion is due to some underhand work on the part of someone, say a fellow clerk? What difference, except in degree, lies between this and the patient on the wards who ascribes all his non-success in life, including his commitment to the asylum, to persecutions by designing people, to the mechanizations of cabals and secret societies, etc.? Consider the good deacon who goes to church on Sunday and on Monday cheats his neighbour in a horse trade. He firmly believes that there is a hell and that dishonest people

go there, but he escapes easily from his dilemma by reflecting that a horse trade is a horse trade and not subject to the strict rules of honesty; that his neighbour should have been more astute, etc. How often do we hear that "business is business", "a man must make a living for his wife and family", "I make good use of this wealth I have gained and contribute liberally to worthy objects," etc. We rationalize every time we deviate from the straight and narrow road, and that we do so is quite right and necessary. No man is perfect and if he condemned every slip and fault, life would again not be worth living.

Another way to avoid pain is to repress all painful ideas and conceptions. A great deal has been written on this of late. Suffice it to say here that it is quite a normal habit for most of us to forget, or at least to force back from the forefront of consciousness, all disagreeable memories which only give us useless pain. The slang term "forget it" is based on common sense. It is, however, possible to push our forgetting to extremes, *i.e.*, not to merely keep in the background unpleasant memories which it would do no good to continually brood over but to actually push entirely out of consciousness all memories of the painful event. But *be it noted such memories while out of consciousness are not out of the mind.* They are still there, but held below the threshhold of consciousness. It is this sort of thing which is meant when people talk about complexes. Complexes are simply buried, repressed memories which carry with them an unpleasant emotional reaction, but although repressed they are not less dynamic than those present in consciousness. They still influence the thought and action of the individual and may under certain conditions come to the surface in a disguised form, giving rise to ideas and actions on the part of the patient which to the outside world, unacquainted with their origin, seem illogical often to the point of insanity. It is in relieving these conditions that psychoanalysis has obtained its vogue. By its means (but often as well by common sense delving with the patient into his past life) the repressed memory may be brought to consciousness. When this is done all the symbolic ideas and actions to which it gave rise, and which neither the world nor the patient can understand will disappear. Of course, once the memory is brought back, the patient will have to bear whatever shame and distress it may cause, but this is usually far less than the agony caused by a complex which is reaching the surface in a symbolic manner. Let us turn again to the wards for an example of this.

A woman of 43 became terribly distressed over the Bible story of the fiery furnace. When seen the patient was extremely disturbed, wringing her hands in agony, and crying out "I look *down* at the fiery furnace and the Devil stands at my elbow, and he says 'You do not believe that, you do not believe the Bible, you are doomed, you will go to Hell, you are in Hell now'." This went on for days until after hours of work I was able to localize the fiery furnace in a hall stove with a mica top situated in the hall of a house on the shore of Lake Ontario where the patient had spent a few years of her life some time between the ages of 10 and 20 (so complete was the repression that she could not place it in time more definitely than this). While living here the patient had misconducted herself with a brother, looking down on the fiery furnace as she had walked along the upper hall in going to his room after the rest of the family were in bed. If we bear in mind that this woman was a very conscientious, well brought up girl, who suffered in addition from a marked degree of magnification of the self we can see how the memory of these episodes caused such pain that she attempted escape through repression. This repression held for 25 years, but the symbolism by which it finally broke through is very striking. Once the facts had been brought back to consciousness and the patient faced in a normal way her quite natural shame and regret, the pathological symptoms so far as they related to this particular episode disappeared.

A word in passing here. Women for obvious reasons take a great interest in the facts of sex, but they are as a rule trained from childhood to repress this phase of life. Hence in women we often find some repressed sexual strain as the basis of their mental instability, but simply because this is often true is no reason for concentrating solely on this aspect and neglecting to investigate other possible causes. In other words, any tendency to make psychiatry a matter of sex alone is to be deplored.

Now in considering these mechanisms by which we are enabled illogically to protect our feelings and more or less escape the harsher facts of life, we are struck with one thing. It is necessary in order for us to build up our illogical reasonings and beliefs that we shut out all facts which would, if we gave them due weight, render impossible these protective mechanisms. For example the mother afflicted with a vicious child will build up a system of excuses for him, she will rationalize his acts, claim that his companions led him astray, that his teachers were at fault, that he is misunder-

stood and persecuted, but when confronted with facts which clearly prove him to be not the follower but the ringleader, facts which prove his teacher to have been very wise, forbearing, and patient, she will not allow these facts to touch for an instant the illogical structure which she has built up to protect herself from the pain of realizing that her offspring is very far from what she would have him. One has only to attend a political meeting to see the same thing. The ardent partyists never for one moment allow facts to influence their preconceived conclusions. In fact, this is the distinguishing mark of all ardent sectarians, it matters not what they are advocating, religious dogmas, political creeds, financial, economic or social innovations. On the other hand the rock-ribbed reactionary is just as impervious to whatever of truth there may be in what he calls wild radical arguments.

We speak of this ability to wall off certain feelings and conclusions necessary to our happiness from the assaults of the facts and experiences of our daily life as a tendency to dissociate. That is to say, the normal mind seems able to divide itself into compartments where we can carry on reasoning processes more or less independently of facts which, if allowed to enter, would completely destroy our carefully built up certainties.

Let me here repeat the statement that dissociation and all the other illogical mechanisms are very useful and necessary to us. Without them and the protection they give to the operation of our instincts and emotions life would be a very dreary business. If men and women (but no woman is foolish enough to try) dissected their emotional life in the same cold-blooded, accurately logical way that they treat a scientific problem, there would be no ardent flaming zealots, no persecutors, no wars, no quarrels, but also no patriots, no martyrs, no self-sacrifice, nothing in short to make life worth living.

But on the wards devoted to chronic diseases we can see scores of patients in whom dissociation has been carried to a point far beyond the normal. Here we see a man of 50 who writes you a cheque for a million dollars and at the same time asks for a street car ticket in order to see his friends in town. Another proclaims that he has just endowed the hospital with a hundred thousand dollars and in the same breath asks for a little tobacco. Another one believes himself to be Lord Aberdeen, in which capacity he makes speeches, wears proudly any medals or uniforms given to him, gives orders to those around him, etc., but at the same time remains the willing performer of menial tasks, sweeping the floors, carrying vegetables, running errands, etc. In other words, the fact that they had not even five cents for a car ticket or tobacco, that they were at the beck and call of everybody and performing trivial tasks, was not allowed for one moment to invade the other side of their personality where they were immensely wealthy and powerful men. To such an extent can these apparently normal and useful mechanisms carry the human mind.

A concrete example will perhaps review and illustrate all that has been said so far.

Some six years ago a woman patient, then aged 38 years, was admitted to the hospital. Her previous history was as follows. She was born in Canada of middle class parents. The family history on both sides was negative for even slight mental defects. The patient had always been a very sensitive, conscientious girl, and her feelings were easily hurt; a good housekeeper almost fussy, rather prim and old-maidish in views with high standards of conduct. She was married just before the war, and proved a very devoted wife, held in high respect by neighbours. Her husband enlisted soon after the outbreak of war. The wife felt this intensely; it was quite evident that she could never even for a short time shake herself free from anxiety and fear lest she should lose him. Towards the last of the war she received the ordinary official announcement that her husband had been killed. She took this news outwardly rather calmly, but said she could not bear to think of him as dead; perhaps there was some mistake. A few days later she received a letter from him written before his death but which had been delayed some time in the mails. She accepted this occurrence as an indication that possibly some mistake had been made. When no more messages came she thought that possibly he was a prisoner. Months later she thought she saw him on the street (very probably she did see some man resembling him), and this was added to her increasing rationalizations about the central idea that he might be still alive. From that time on the line between normal rationalization and abnormal hope fulfilment was passed, for she began to see her husband more and more frequently and soon convinced herself that he was indeed alive. She began to explain his not coming to her by saying that she was sure he was being kept away by some cause. Later, she discovered this cause to be the fact that he was not the person he had always seemed to be; he was a very important personage who was being kept out of his heritage; just who he was or what the heritage was she did not at that time know.

At about this stage organized society suddenly found out that she was insane and had her committed to the hospital. A rather careful physical examination, both before and after admittance, revealed no demonstrable organic lesion. On entrance she was very quiet, well behaved, clean and tidy, quite depressed and unhappy on account of the mysterious mechanizations which were keeping her husband from her. Any suggestions that he was in fact dead were met with point blank

denials and a pitying smile at our credulity; all efforts to shake this belief failed. The patient attended the vocational class regularly, and performed conscientiously any task set her, but it was easy to see that her interest in her work was purely perfunctory. Her whole mind was taken up with her own problems. Soon after entrance she discovered who her husband was—a member of the ruling house of England. Next followed the discovery that she herself was of royal blood, in fact the true queen by virtue of direct descent from the Tudors. The Stewarts and Hanoverians were usurpers. Phantasy entered in. She became in truth the queen seated on the throne, admired by her subjects, owning the hospital and all that she could view from the windows of her ward. And now as Mary Tudor, descendent of a royal race, and rightful Queen of England, she has found a satisfactory escape from the mental anguish of her widowhood.

The steps are fairly clear. In the first place she was temperamentally well within normal limits, but rather on the schizoid side; in other words she was a careful, painstaking, persevering and thoughtful girl. There was a good deal of magnification of the self as evidenced by her extreme sensitiveness, and this magnification of her feelings increased the shock of the psychic rock—her husband's death—to such an extent that the patient could not stand up under it and sought a road of escape. Being on the schizoid side this form of escape was likely to be efficient and permanent, as the event has since proved. The patient first used an exaggerated form of emotionally controlled thinking; she would not believe her husband was killed; next she rationalized on very insufficient facts, *viz.*, the delayed letter and seeing some man who resembled her husband. The rationalization diverged still further from normal limits in her attempts to account for his not coming to her. Phantasy completed the escape and created a world in which she was no longer the poor lonely widow. Dissociation was always present, as she never allowed facts like the official report of his death or his non-appearance over a period of years to shake her carefully built-up edifice, and now the dissociation is complete, for she never allows the fact that she makes beds, sweeps and dusts, and has no clothes except what are given to her to affect the other side of her life in which she is the Queen of England.

This woman is labelled dementia præcox of the paranoid form, but except where her protective mechanisms are concerned her intelligence seems to be normal. She is able to perform any work which an ordinary housewife does; she shows intelligence in helping the nurses to feed and take care of patients, and is a valuable aid in the infirmary ward in which she is kept. Her age is now 48, and yet we call her a case of young dementia; even the sub-classification "paranoid" is misleading, as the phase in which she believed she was persecuted has almost entirely passed, leaving her secure in a very pleasant world. In other words, while the label is the same, the picture is totally different from that of the young girl who has always been "strange", not shy and not sensitive, not easily hurt but withal shut in, not sociable, showing no interest in the things which interest other girls, always giving the impression of having an inner life not visible to the world. This individual at an early age will exhibit strange conduct,—fits of irritation or unreasoning elation, staying in bed all day, going out at night, neglect of her person, not eating, or else taking her food in a disgusting way. Her parents are forced to send her to an asylum where she will perhaps stand for hours without moving. Her limbs may remain fixed in whatever position the doctor or nurse may place them (catatonia). She may never speak, or her utterances may be utterly bizarre and strange. She may be very filthy and untidy (hebephrenia), subject to outbursts of violence. She may tear and lacerate her person, showing no evidence of pain. Her hands and feet may be always very cold and blue. There may be short remissions but usually such patients rapidly progress to an utterly deteriorated state. This is the picture of dementia præcox, the type in which as yet we can discern no definite causal factor.

In the case we have just presented, however, there are at least some factors apparent, viz., a fairly well marked magnification of her feelings and a large psychic rock. Therefore, to distinguish her from the typical dementia præcox I speak of her as a middle-zone case. Lack of space forbids me to cite examples from the other end of the scale, *viz.*, the typical early manic depressive in whom we can discern no particular reason why he should have violent upsets in mood, or the case of the mature individual who breaks down for the first time into extreme depression or mania, and in whom we can nearly always discern the above psychic factors.

The last point I want to make is in regard to

the possibility of making a correct prognosis. In no class of medical work is it more necessary to make, if possible, a correct prediction of the outcome. The wife who finds that the bread-winner has broken down, leaving her perhaps with a young family, desperately needs to know whether he will ever be of use to them again. She needs to know if she should immediately take steps to safeguard and realize on whatever means she may have, whether it is necessary for her to break up her home, sell whatever interests her husband may have owned, and make arrangements to keep her family in accordance with her new circumstances. The husband left with a family is in a similar position. With a physical illness the problem can usually be decided in a few months, but in mental work the wife may wait and hope for recovery, not months but years, meanwhile spending her small savings and letting slip all chance of making a profitable disposal of whatever estate her husband may have left. On the contrary, if a bad prognosis is given which ultimately proves unjustified, the husband may recover to find his home broken up and his means of livelihood taken from him.

This matter of a correct prognosis is one of the most difficult things in psychiatry. A correct appreciation of the position of the patient on the temperamental scale will help to some extent, but a careful estimate of the efficiency of the escape mechanism used will help still more. For example, I felt that the prognosis in the above case was from the first rather bad, in spite of the fact that she was quiet, not at all deteriorated, cooperated well with the doctors and nurses on the ward, and did everything we prescribed in order to maintain contact with the real world; she has always in fact maintained a superficial contact with reality. In spite of this her previous history showed that she was on the schizoid side and the psychosis at the time of admission showed a tendency toward the typical schizoid efficiency. This efficiency in the escape mechanisms has been maintained, and in the present state of our knowledge we must to-day regard the case as hopeless, not because the patient is deteriorated, not because she shows signs of mental degeneration, which, indeed, is not the fact. To all appearances the case is hopeless simply because she has satisfactorily and completely escaped from all her anguish and distress. That is to say, the woman does not recover because fundamentally she is happy as she is and would be unhappy if she emerged from her protective mechanisms into the world of reality.

Supposing, however, she had been on the shallow, open side, what then might have happened? In all probability there would have been no efficient building up of her present elaborate protective structure. She might have taken some very much simpler and less efficient way, *e.g.*, she might have gone into an intense depression and have obtained partial sympathetic relief in the anxious care and attention which relatives and friends would have given. She might have secured relief by releasing all self control and inhibitions (mania). She could have obtained sympathy and a feeding of her wish to occupy the centre of the stage by a neurasthenic magnification of some very slight physical illness or defect. Hysteria would serve the same purpose. She could have sought oblivion or stimulation by drugs or alcohol, but none of these methods would have been effective. In some of them indeed she would only have jumped from the frying pan into the fire. Hence, when we see these manifestations or the type of temperament in which they are likely to occur, we are fairly safe in saying that the patient will recover for the simple reason that the psychosis does not efficiently fulfil its object, *viz.*, an escape from stress.

This manner of looking at mental illness also helps the writer to some understanding of that very large group of cases which show mixed forms of insanity, *viz.*, the patients are sometimes depressed, sometimes manic, sometimes show strong indications of a præcox syndrome, and, withal, show evidences of hysteria. In practically all of this type in which the writer has had the opportunity of obtaining an accurate picture of their previous state he has been forced to conclude that temperamentally they have been very close to the normal centre. In every case, also, the amount of magnification of the feelings was very great and in many the psychic insult was also relatively great. Hence he conceives these mixed cases, (forced by the last two factors to secure relief) as casting about as it were in both directions, sometimes trying in the

schizoid way of building up a world of their own, and sometimes by the phenomena which we associate with a cyclothymic temperament. The only way to form an opinion is to try and see just how effectively they are gaining their end and judge accordingly.

SUMMARY

1. Every mental patient should receive as careful a physical and laboratory examination as can be obtained in order to ascertain any possible physical cause for his condition. In the present state of our knowledge no physical basis will be found for many cases of mental illness and a psychogenic approach will be the only possible basis of management. This paper is confined to these so-called psychogenic types.

2. These psychogenic patients can be divided roughly into two classes: (a) Those who are at the extreme opposite ends of the temperamental scale, namely, closed and open types, which develop at an early age into typical cases of dementia præcox and allied disorders, on the one hand, or, on the other, in recurrent cases of manic depressive insanity. No causal factors other than their position on the temperamental scale can yet be assigned for these cases. Temperament may be a matter of biochemistry, or there may be a psychic entity. (b) A great group of cases where the breakdown occurs later in life, and in these the position on the temperamental scale approaches more nearly the normal mean. In these (designated for the purposes of this paper "middle-zone" cases) we can detect at least two additional factors. (1) The existence in these patients of a greater or less degree of magnification of their feelings. (2) The presence of some degree of trouble or anxiety, called the psychic "rock" or "insult".

The existence of the first factor reinforces the second, and the individual is very liable to escape from his distress by some form of mental illness. If the first factor is not present the individual will be much more liable to face his trouble in a common-sense way, *i.e.*, there will be no escape by the road of insanity.

3. The conception of mental illness as an escape reaction is a very valuable one, especially in these middle-zone types. This escape can take many forms. The patient can take the open road and be either manic or depressed; he can turn to drugs or alcohol; he can become hysterical or neurasthenic; or he can take the closed road and build up an unreal world of his own which suits him better than reality.

4. If he builds up this unreal world he makes abnormal use of many mechanisms which we normally use to protect ourselves from a too cold, calculating outlook on life. The common ones are:— (1) emotionally controlled thinking; (2) rationalization; (3) phantasy; (4) repression; (5) dissociation.

5. Many of these middle-zone cases finally arrive at a point where they are diagnosed as true dementia præcox cases, but they present marked points of contrast with the typical young case of dementia.

6. An attempt at prognosis can be made by determining first the position of the individual on the temperamental scale; secondly, by noting how efficient in giving relief from stress the psychosis is. The amount of magnification of the self and the degree of psychic insult should also be investigated.

The above conceptions afford a clue to the mixed cases which the writer believes to be almost invariably toward the centre of the temperamental scale, and where he also believes he can detect a maximum of magnification of the self and also a maximum of psychic insult.

7. Since we cannot yet alter the position on the temperamental scale, it behooves us to try and recognize in time the great impelling factor which leads people to decline to face the world, viz., the tendency towards magnification of the self. We may also find some means to lessen the psychic rock. If we see evidences of an abnormal use of normal protective mechanisms we may also be able to intervene.

To sum up, the problem of insanity must be met in the same way that preventive medicine is attempting to meet other medical problems. The profession must first clearly recognize underlying principles, and the public must be educated to heed their advice.

AMNESIA: DUAL PERSONALITY: WITH SPECIAL REFERENCE TO A CASE RECALLED BY HYPNOTISM*

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IN a general way any modification of the organism by experience may be considered as "memory". The materials for memory are gathered through all the senses. Defect of any of the senses correspondingly diminishes these materials. The processes involved in remembering are: (1) apperception, *i.e.*, appreciation, learning or grasping; (2) retention or conservation, this "fixing" depending on attention or interest and involving elaboration or association with similar previous experiences; (3) reproduction or recall, or effect on later behaviour of the individual. Amnesia, or loss of memory, then, may result from defective impressibility, defective retention, or defective reproduction.

If, then, there is no impressibility, or no retention, there will naturally be no recall. But the converse is not necessarily true, for absence of recall need not imply absence of memory, for it is a commonplace of our daily lives that memories that cannot be recalled at one moment or day may come, though unbidden, at another; the appropriate stimuli of circumstance or association recall them. The so-called conditioned reflexes of our daily lives, such as walking, stepping off a curb, avoiding a hot poker, etc., are the responses to early memories of falls, of burnings, of cuts and bruises that are no less memories even though we are not consciously aware of them. Finally, we have the various normal and pathological conditions wherein many memories are present yet buried in our unconscious minds, to be recalled only by special methods such as psycho-analysis, hypnosis, crystal gazing or automatic writing. When a person says "I cannot remember" it may be that no memory exists, or that he has suffered from a neural deterioration, or that the recall has been interfered with by some other factor, such as an emotional block.

Let us now consider some of the disturbances of memory involving impairment of the processes of impressibility, retention and recall. It is impossible to reproduce an idea which has not once been represented in consciousness. Imperfect apperception gives rise to imperfect or absent recollection. We see this in all deliria, post-encephalitic clouded states, and in the Korsakow syndrome. It is readily demonstrable in any kind of distraction or poor attention, particularly in exaltation and the manic depressive psychoses. It is a commonplace in idiots and imbeciles. In all dementing processes there is a fading of memories of both recent and remote events, as in epileptic, paretic, arteriosclerotic and the simple senile psychoses. In this group amnesia may ultimately be total. However, many of the apparent memory defects seen in the latter group, as well as in dementia præcox, are primarily disorders of attention. Memories may be more or less permanently effaced without permanent clouding of consciousness, as in epilepsy, hysteria, paralytic attacks and following traumatism. More serious memory losses may follow the deliria of fever, acute confusional states, and partial recovery from exogenous poisons, especially alcohol, and are the result of nutritional disturbances as in the subsequent cerebral atrophy of senility with its concomitant enfeeblement of mind. Disorders of memory following traumatism are apt to affect memories of events occurring just before or just after the moment of accident. Toxic amnesias are characterized by the fact that after the patient has returned to a state of consciousness an unbridged gap remains which cannot be filled by memories, with some amnesic overlap before and after. Amnesia without loss of consciousness is rare.

In functional amnesias, according to Janet, there are two groupings: systematized and localized amnesias. The systematized amnesias are those in which the forgotten ideas are related to a certain subject, regardless of the

* Read before the Montreal Neuropsychiatric Society, October 28, 1930.

period of time when they were experienced. The localized are those in which a certain period of time in the patient's life is lost. Thus, to illustrate the systematized form, Morgan relates the case in which, as afterwards elicited by special methods, a boy had an intense hatred of his father for the latter's abuse of the mother. The emotional block was so great that though the boy's general conscious memory was good there was absolutely no remembrance of the father, nor of matters immediately associated with him through all the years. Such systematized amnesias may involve any group of associations, as is experienced by anyone using the psychoanalytic approach. The localized form, *i.e.*, whole periods of life forgotten, is more particularly associated with double personality. The mechanism behind this form is somewhat the same as in the systematized, the difference being that in the localized form the troublesome scene cannot be blocked off without taking quite a large portion of the personality with it. When the distressing scene is too closely knit with the concomitant circumstances the only way to forget it is to bar out everything that happened in the same chronological period in which they were experienced. Buckley says,

> "Continuous amnesias are characteristic in all cases of double personalities. Usually, in such cases, following a period of sleep, the patient awakes experiencing a feeling of strangeness and is found in a mental state devoid of memories of the past. Little by little, he is obliged to undergo fresh instruction in the matter of all things with which he was formerly acquainted. Such patients usually acquire knowledge rapidly—more rapidly than in the normal state—and soon again become familiar with persons and things in their environment, but still occupying an attitude as if objects were seen for the first time. It is in this state that the patient may develop the new or second personality which may persist for days, weeks, or months. The patient may again be seized with a sleep similar to that which preceded the new personality and when awakening find himself in the same state as before the first sleep, but with no remembrance of the new personality, or of anything that happened in the interval. The two personalities may then alternate for years with a certain amount of regularity. In neither of these states is the other state remembered, nor is one personality known to the other."

In tracing back previous descriptions of multiple personality, I followed the routine of such investigations and glanced through Hippocrates, but without success. From then on through the Hebrew Scriptures and the Dark Ages there are many indications of such occurrences, but the affected individuals labelled with the stigmata, on the one hand, of being possessed by demons or of consorting with the Evil One, or, on the other, regarded with awe or even worshipped as saints. Two or three centuries ago, I have no doubt, some of these were among the witches who were hanged on the gibbet or burned at the stake. I believe that it was only about the middle of the last century that physicians in France first began to take a real interest in these cases, at least to the extent of careful observation. A generation later this became more definitely scientific, under the stimulus of the hypnotic interpretations instituted by Bernheim and the Nancy school, and followed up by Janet, Binet and Forel. These men have left many careful studies of such cases of multiple personality, among the best known of which are those of Irene by Janet and Félida by Binet.

The interest in such matters soon spread over the western world, with a most striking repercussion in the United States where James, as early as 1880, reported the famous case of "Ansell Bourne", to be followed about twenty years later by that of "Miss Beauchamp", of Morton Prince, and of "Thomas Hannah" by Boris Sidis, as well as the more recent, though none the less famous, case of "Doris" by Walter F. Prince. It is to be pointed out that each of these cases presented anywhere from two to seven different personalities which though in the main mutually exclusive were not invariably so, as occasionally there was some overlap.

CASE REPORT

J. B., male, aged 12 years.

Complaints.—Loss of memory.

Present history.—Pneumonia twice; eczema in infancy. A healthy boy of good intelligence and normal behaviour, inclined to be a favourite; pleasant and polite. There was a tendency to be studious and, though friendly with other boys, he would prefer a book or the company of his sister to joining them in their amusements. Very much interested in the Bible and Bible stories; rather "goody-goody", neat, proper, and particular. There was no history of convulsions, sleep walking or fugues. He had always been head of his class.

Present illness.—Out of a clear sky, without a suggestion of what would appear as abnormal behaviour to the parents, he disappeared after school on March 28th, apparently perfectly normal, and was found asleep in a ditch at St. Hubert, about 15 miles from Montreal, at 11 p.m. Those who found him could obtain no reply from him. Next morning he responded somewhat, but did not recognize his mother. Since then he has been rather quiet and is relearning his relationship to his mother, his sister, his dog, etc. He knows what he is eating. His actions otherwise are fairly normal and his

relationships as above are acknowledged after instruction, rather than through actual realization.

Present condition.—He obeys orders during examination quickly and well. His replies to simple questions are fair. He does not remember where he lives or what school he goes to, but seems fairly oriented as to people, place, time, and purpose in the hospital. He shows no insight into his condition. He can do simple arithmetical problems. He does not talk spontaneously, but responds readily, and is not irrelevant or incoherent. He takes foolish or incongruous questions seriously, not seeing the incongruity. His look is clear and even alert. Motor power, development, nutrition and tone are normal. Sensation is normal. Coordination is normal. The reflexes are normal. The cranial nerves are normal. The serological reactions, done some months later, are normal.

April 8th.—There is increasing acknowledgment of his environmental relationships, but he is still a bit hazy about places and names. In fact, when re-introduced to his class-room he failed to recognize his teacher and class-mates, and walked right through the room, saying, "There is nothing but a bunch of kids there."

April 22nd.—The past is still a blur. He adjusts himself well to his environment, though he is rather forgetful. In other words, he is re-learning, but it takes some time to fix the renewed ideas. He has had two years of piano-teaching. He did not see his piano, lately, until a few days ago and, when he did, he did not recognize it or its purpose, knew nothing about musical notes, or how to play. He is able to read as well as before. If asked what he has just read he has to read it over to recall it. He is nice and quiet in behaviour. He saw his roller skates and thought they were funny contraptions, but relearnt their use very quickly.

May 13th.—He has re-established relationships with his boy friends, with the church choir, singing, playing the piano, with his immediate relatives, in each case after a few explanations were made to him. In regard to table manners, care of the person, and general behaviour there has been practically no hiatus. He had not put pencil to paper until to-day. When asked to write anything that came to his mind he did so in the old way of handwriting, punctuation, composition, and style (or lack of it), but he did not start a new paragraph when dealing with a new subject. On the other hand, his attitude towards his past is not that of recognition, but of an unknown situation to which he is being re-educated, and he is taking it all in in an indifferent but resigned and obedient manner. For instance, when asked how long he had known his mother, he replied, "Since St. Hubert." "Do you remember anything before St. Hubert?" "No."

May 27th.—A new attitude. If he cannot get his own way in fairly reasonable but inconvenient requests he does not answer, but just sulks.

June 3rd.—Spelling was normal when first tested after St. Hubert. Re-introduced to his singing teacher by his mother with the words, "This is Miss Brown, dear," and being asked a moment later who the lady was, he said, "This is Miss Brown, dear."

September 16th.—On the day after his fugue he was able to read and understand everything as though nothing had happened. He has returned to the same class he had spent two months in before and finds the work too easy. He has never recognized anyone as an acquaintance from the period before the accident. He plays the piano better than ever before. He is quieter, more subdued, and better mannered than before.

Attempts at recall were then made and since other methods proved of no avail hypnotism was resorted to. The procedure was first begun with the aid of Professor Estabrook's phonograph record, but after a few preliminary trials, which proved quite satisfactory, a more direct procedure was adopted. For the purpose of reinforcing the suggestion, usually the patient was given some idea before the actual hypnotism of what would be required of him. During the month of October he was hypnotized several times. It proved a comparatively simple matter to get him fairly deeply under and the responses were very satisfactory. There was some variation in the questions asked in the different seances, but the responses to any question were practically the same whenever repeated.

At first the purpose was to elicit information as to the patient's past, more particularly in regard to the circumstances immediately preceding his loss of memory. In the later seances an effort was made by post-hypnotic suggestion to induce him to recall the past to his conscious memory. The few attempts made were unsuccessful until the last one.

The following are the responses of the patient to the questioning on this occasion. I said to him: "I want you to try and remember as far back as you possibly can in your life. A great many people are able to remember back to four or five years of age, some even to two or three years. I wonder if you can do it. What is the first thing you can remember in your life? Think back as far as you can." A.—Fell down the back stairs. Q.—Did anything happen? A.—No. Q.—Were you badly hurt? A.—No. Q.—How old were you at that time? A.—About two years old. Q.—What is the next thing you can remember? A.—My mother died and I went to live with my aunt. Q.—How old were you then? A.—About 2½ years old. Q.—Next? A.—Became ill when returning from a wedding. I vomited. Q.—How old were you then? A.—About three years old. Q.—Next? A.—Cousin Benny gave me a ride on his bicycle, and then I remember when I was three years old we had a Christmas tree which nearly reached the ceiling. Q.—Next thing? A.—My father married again and my two brothers came to take me home. Q.—Next? A.—My two sisters came back from the States and we went to the station to meet them and they were not there, but when we got home we found them at home. Q.—What is the next thing? A.—Struck a boy with my stick and got a licking from my

mother. Q.—How old were you then? A.—About four years. Q.—What else? A.—We moved from Wellington Street to Duquesne Street, and Lloyds, the bakers across the street, gave me and my sister each a little cake with icing on it, the kind they sell three for a nickel. Q.—What is the next thing you can remember? A.—Went to kindergarten at Maisonneuve at about the age of 5. Q.—Can you remember the teacher's name? A.—Don't remember much; she was a nice teacher. Q.—Tell me something a little later than that? A.—Went to John Jenkins' school. Q.—How old were you at that time? A.—I was 6 when I started there. Q.—What is the next thing you can remember? A.—I got my first pair of skates. I was about eight years old then. Q.—Did you ever have any fights? A.—A couple. Q.—When and with whom? A.—When in the third year at school. There was another boy called me 'Sissy' and I beat him up for it. Q.—Tell me something of the names of some of the boys in your class at 8 years of age. A.—Fred. McEwen and Douglas McGimpsey. Q.—Were there girls in your class at that time? A.—Yes. Q.—Do you remember the names of any of them? A.—No. Q.—Suppose we skip on to ten years old. What do you remember about that? A.—I was in room 10, Maisonneuve School. Q.—What was the teacher's name? A.—Miss McKinnon; she was nice and was liked. I have not seen her for the past six months. Q.—What were the names of some of the boys in your class? A.—Dan McIntosh. Frank Wethersley. There were girls in the class but I cannot remember any of them.

That year he vomited in the class and was taken home in a taxi. He remained home one or two days, but no doctor was called. At 11 years old he was in Miss Swan's class (VI - 1). Q.—What was the colour of your teacher's hair? A.—I don't remember. Q.—What do you remember? A.—The whole class were kept in for French and the teacher was lecturing them near the last when one boy said "Get out the cannon. This is the Spanish-American war." The teacher took him by the neck and slapped him. The class laughed, and was dismissed. There were 29 in that class. Q.—At 12 years of age? A.—The teacher was Miss Martin. School started near the beginning of September, 1929, (exact date not recalled). There were nearly 32 in the class including the patient, and consisting almost equally of boys and girls. Some worked hard. Q.—Were you the worst boy in your class? A.—No. Q.—How do you think you ranked that way? A.—I guess I was about the third worst. Q.—Did you dislike any of the other boys in the class? A.—No, not particularly.

Now, John, I want you to observe very carefully. We are approaching a very important point. Q.—Do you remember anything special happening in January? A.—No. Q.—In February? A.—No. Q.—In March? A.—No. Q.—20th, 25th, 26th, 27th, 28th? A.—No. Q.—Well what happened on the 28th? A.—Not anything. I was just at school and went home. Q.—Alone? A.—No. Q.—Who was the other boy? A.—I don't know his name. Q.—Do you remember his face? A.—No. Q.—Go ahead. A.—Went along to the corner of St. Catharine and Aird Streets and then we parted. I got on to Theodore Street and then I went into the lane. Q.—Why? A.—I always go that way; it is a short cut. Q.—No other reason? A.—No. Q.—What happened?

At the first attempt to elicit special facts the patient showed considerable emotional tension and groaned "Oh, it was terrible". Q.—Well, what happened? A.—Something hit me on the back of the head. Q.—What? A.—I don't know. Q.—Do you think it was an automobile? A.—No, there were no automobiles in the lane. Q.—Do you think someone threw a rock at you? A.—Maybe, there were boys playing there; I don't know. Q.—What happened then? A.—I must have gone unconscious. Q.—Next? A.—I found myself walking along the highway; then everything began to get black and whirl around me, and I think I must have fainted. Q.—Next? A.—A man came along in a Ford truck, ½ ton truck, 1929 model, and held me up at the side of the road. Q.—Yes? A.—Then another Ford car, a sedan, model 1929, with glass windows, came along and this man took me in his car and drove me over to the airdrome at St. Hubert. Q.—Was it a long drive? A.—About five minutes. Q.—Next? A.—A mounted policeman put me on a couch and put some cushions under me. Q.—next? A.—Before that, he took me across to a restaurant and got me something to eat, and then gave me a shower, then put me on a couch,

and I went to sleep. Next morning the mounted policeman showed me the airplanes. Then my mother came. Q.—Did you recognize her? A.—No. Q.—Do you think you can recognize her now? A.—I don't know.

Several questions were then asked to establish the fact that the patient during hypnosis remembered not only the past but the present. Q.—How did you get across to the St. Lambert side, across the St. Lawrence river? A.—I don't know. Q.—By the bridge? A.—I don't know. Q.—Did you go with anyone else? Did anyone kidnap you? A.—I don't know.

I want you to remember everything you have told me. A.—I will try to remember. Q.—What keeps you from remembering things? A.—I can't remember; I don't know. Q.—I want you to remember. A.—I might; I will try. Q.—Where do you live now? A.—Louis Veuillot Street. Q.—What did you have for dinner yesterday? What date was yesterday? A.—Yesterday was the 27th of October, 1930. Q.—Are you attending school now? A.—Yes, at present I am attending the Commercial High. Q.—Where are you now? A.—I don't know; in some house, I don't know just where. Q.—Tell us something about it. A.—Well, there are a whole lot of doctors here.

The patient was then roused and, on being questioned by the assembly, knew absolutely nothing of what had transpired, but that he had been asleep and could give absolutely no inkling as to what had happened to him before the morning of the incident above described, when his mother met him at the airdrome. Realizing that all preceding attempts to recall his past life to his conscious memory had failed he was immediately hypnotized again. He was warned before and during hypnosis that he was to go under very deeply, was informed that the operator was rather disgusted with him at his failures in spite of repeated admonitions to remember the past in his waking moments, and was reminded that the patient had not quite played the game in spite of his promises, and finally in a somewhat harsh tone he was informed that the operator was not going to waken him at all, but would let him get up when he liked with the understanding that when he woke up he would remember everything.

The meeting proceeded, and as the patient an hour later was still sleeping deeply, the hour was getting late and it was time for the meeting to disperse, the operator was compelled to give a somewhat contradictory suggestion to the patient, that is to say, he was told "We can't be waiting here all night till you get good and ready to get up so I had to change my mind and waken you up, but I am not releasing you from your obligation to remember everything when you get up." Just prior to being wakened several tests were applied, *e.g.*, a pin stuck through the skin of his right forearm, the corner of a handkerchief rubbed across the eyeball, his nose pushed back hard with the palm of the hand, etc., to all of which tests he showed not the slightest sign of feeling. Then he was wakened up, and on being questioned his replies were as follows: Q.—How long did you sleep? A.—I don't know. Q.—Where were you sleeping? A.—I remember falling asleep. Q.—Did someone speak to you when you were asleep? A.—I don't know. Q.—How old are you now, John? A.—Twelve. Q.—How far back can you remember? Tell us the earliest thing you can think of. A.—Mother gave me a ride, and brought me home in the train. Q.—When was this? A.—In the morning; I do not know the date. (This of course refers to the morning of the 29th, the day after the accident.) Q.—Where from? A.—St. Hubert. Q.—What else can you remember at St. Hubert? A.—There are airplanes there. Q.—What made you lose your memory before that? A.—I don't know. Q.—Do you remember how you got to St. Hubert. A.—No. Q.—Did you walk? A.—I don't know. Q.—How about school? A.—I was told I had been there before and was going to go again.

Obviously the attempt to recall his memory to consciousness was a failure again. However, three days later this communication was received from his mother.

Dear Doctor,

Just a few lines of apology for my seeming irritableness on Tuesday evening. I am afraid I lost my nerve through sitting alone with John while he was under the hypnotic spell. A slight change has been noticed in John already. He remarked at supper time last night (Wednesday) that the pudding I made for dessert that evening tasted like Christmas pudding, also that he hoped he would have a better time this Hallowe'en than he had last year. I asked him what was the trouble last Hallowe'en and he said the French boys spoiled all their fun. Also this morning (Thursday) he was singing an anthem they had in church last Christmas. I asked

him where he heard that and he told me they had that last Christmas. You told me I could tell him any of his past but as it seems to be coming back gently to him I thought I would let Nature do its own work which I think you would wish me to do. F. B.

Subsequent to this letter reports have been received from the mother that many additional individual memories are coming back day by day, and the reporter is inclined to believe that the whole of the memory will have been re-established to at least the state it was in before the accident in a comparatively short time. He is further inclined to think that had there been no contrary suggestion at this last seance, and had the patient been allowed to sleep it out he would have wakened with a complete restoration of memory. Finally, attention might be called to the facts that his unconscious memory, contrary to Buckley's statement, included the conscious, but the conscious did not include the unconscious; also that we were able to make him recall his memory to two years of age,—a thing that he probably could not have done in his normal state.

As there had been no further return of memory in the interval, advantage was taken of a business and social meeting of about sixty medical men, at which the patient was made much of, to hypnotize him again. He seemed to be greatly impressed and was told not to wake up until next morning, with his memory fully and permanently restored. This meeting took place on December 29th last at the writer's home. He woke next morning at about 8 a.m. and on being questioned as to his past was able to reply just as though there had been no hiatus. Though he admitted he was quite happy about it he took this restoration quite coolly. His mother then questioned him on subjects, not brought out in the previous hypnoses and unknown to the writer and he replied quite normally. He has been normal ever since.

THE DIFFERENTIAL DIAGNOSIS IN "BORDERLINE" CASES OF HYPERTHYROIDISM*

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THE members of this Society who were so fortunate as to hear Dr. Seed's paper at the Seattle meeting, on "Hyperthyroidism and neurosis", will remember that most of the clinical points in differential diagnosis were so thoroughly covered that it would seem inopportune to again bring up this subject, were it not for a case which came under my observation during the present year, the rarity of which I felt would ensure your interest and be a basis for some useful discussion.

The patient, a male, aged 23, a truck-driver, was admitted to the Hamilton General Hospital on December 6, 1930, complaining of pain over the right chest posteriorly, dyspnœa, general malaise, cough, nervousness, palpitation, and hoarseness. The patient stated that these symptoms had been present for about two weeks, with the exception of the hoarseness; which had been present for several years. He also stated that, three years previously, he had been in hospital, where he was informed that he was suffering from disease of the lungs, heart and liver.

Functional enquiry.—His appetite was just fair and his bowels regular. There had been a slight weight loss since the onset of the present illness, but weight had been well maintained up to this point. Heat intolerance was absent. He was sleeping well. Upon examination, no abnormalities were found in the respiratory system. The heart was found to be enlarged, 9 cm. to the right and 4 cm. to the left of the mid-sternal line. The apex impulse was heaving in character, with an irregular irregularity. The heart sounds were of relatively good character, with no murmurs. The pulse was irregular, from 105 to 140 per minute.

No abnormal findings were noted in the abdomen, and the nervous system showed only moderately increased reflexes. External genitalia—normal. The hands were clammy and cold. No tremor was present. The thyroid gland was apparently normal.

Special examinations.—Urine, normal on repeated examinations. Blood, average of repeated examinations: red blood cells, 4,000,000; white blood cells 11,600; hæmoglobin, 65 per cent; polymorphonuclears, 57; large lymphocytes, 13; small lymphocytes, 16. Blood chemistry (average), urea nitrogen, 12,000; creatinin, 3,580; sugar, 0.132; calcium, 9.2. A blood culture was negative. The Wassermann test was negative. The blood pressure varied from 200-140 to 180-126. The x-rays of the chest confirmed the physical findings as regards the heart, otherwise negative. Teeth, negative. Chest: a repeat plate on January 28th showed the heart shadow broadened 1 inch from previous skiagram.

Basal metabolic rates.—December 9, 1930, +85 per cent; December 20, 1930, +75 per cent; December 30, 1930, +63 per cent; January 8, 1931, +61 per cent.

The provisional diagnosis was hyperthyroidism; endo- and myocarditis.

* Read before the American Association for the Study of Goitre, Kansas City, April 8, 1931.

Progress notes.—We saw this patient two weeks after admission to hospital and put him on a test course of Lugol's solution over a period of 13 days. Finding no reduction of the pulse rate and no appreciable reduction in the basal metabolic rate, we ruled out the previous provisional diagnosis of hyperthyroidism. Our suggestion at that time was that he had some other involvement of a gland of internal secretion, possibly the suprarenals. Lugol's solution was discontinued. On January 19th, his temperature started to rise, and on the 23rd he developed a generalized pain over the lower chest, and his appetite, which had been fair, was now gone. The patient grew progressively worse, until on January 29th, he went into a comatose condition and died.

Post mortem examination.—The thyroid was normal in size and appearance, and no thymus was found. The liver was somewhat enlarged, and the spleen enlarged and firm. The lungs showed the ordinary post-mortem congestion and evidences of broncho-pneumonia. The heart weighed 790 grams. The mitral valve showed the presence of numerous vegetations. The aorta above the aortic valve showed considerable atherosis. The left ventricle was somewhat thickened. The left kidney was normal in size and appearance. In the right renal space was an encapsulated tumour of the suprarenal body about 6 cm. in diameter, separated from the kidney. This was degenerating, showing yellow atrophy. The bladder and ureters were normal. There were no abnormalities in the osseous system, and no testicular change. The pathological report on the tumour by Dr. Deadman showed it to be a carcinoma of the malignant type of adenoma described by Ewing.

DISCUSSION

The outstanding points of interest in this case, and of importance in a differential diagnosis, were the persistently high metabolic rate, and the inconsistency between this rate and the loss of weight; the high rapid pulse, uninfluenced by Lugol's solution; the lack of heat intolerance; cold hands; the absence of tremor; and the failure to palpate any adenomata or pathological change within the thyroid itself. It is interesting to note a slight loss of weight associated with the high basal rate, as compared with what we observe in hyperthyroidism.

The absence of heat intolerance and tremor, and the cold hands mentioned in the case history, have been frequently explained before this Association. I hope to be pardoned if I recall the importance of the palpable changes in the thyroid gland as of special significance in differential diagnosis, because I am becoming more and more convinced of the rarity of hyperthyroidism without gross evidence being apparent to the examining hand. To repeat, when an adenoma is not palpable or when no bruits or thrills are to be felt, and especially when no "hardening" takes place after giving Lugol's solution, a diagnosis of hyperthyroidism becomes a dangerous temptation towards what may prove a useless surgical procedure.

True high metabolic readings are almost always pathognomonic of hyperthyroidism. I have occasionally seen readings as high as 45 per cent in some of the blood dyscrasias, and in the rare terminal heart lesions. This coincides with the observations of Boothby, Rabinovitch, and Campbell, expressed in personal communications. The explanation of these readings, which may be considered as "true metabolic rates", is that an active principle of the adrenal body is liberated by the overgrowth of its cellular elements, and that it is analogous to the liberation of the toxic elements of the thyroid in diseases of this organ. I have been unable to find any report of similar findings in reported tumours of the adrenals, although I believe some of the French writers have noticed the phenomenon. Swale Vincent,[1] in his work on "Internal secretions and ductless glands", suggests that death following adrenal removal is probably due to a defect in muscular metabolism, but makes no mention of the stimulating effect of tumours. He also draws attention to the close relationship between the adrenal gland and the sympathetic nervous system.

We depend upon certain signs and symptoms in differential diagnosis, but it would seem that we must analyze these symptoms upon their pathological basis, following either the theory of Moebius, that hyperthyroidism is a thyrogenic disease, or the theory of Warthin and Stevenson, who suggest a polyglandular or status lymphaticus possibility. Hellwig[2] says that "the modern surgical treatment of Graves' disease has as its foundation the theory of Moebius", and we know that those who criticize this treatment as scientifically unsound follow the opposite or polyglandular theory. If our treatment is based upon a certain pathological basis even though it be a theory, it is logical that differential diagnosis must demand the same scientific background.

The case reported is offered as evidence in favour of the thyrogenic theory, because two of the major symptoms, namely the fast pulse and high metabolism, have been shown to have had their underlying cause in a proved pathological condition entirely apart from either macroscopic or microscopic change in the thyroid gland. The possibility is open to consideration of any condition which will stimulate the vegetative nervous system, simulating one or all of the

symptoms of hyperthyroidism. Crotti[3] says that "the nervous system drives the thyroid and the thyroid drives the nervous system", but I believe there are many so-called "border-line" cases presenting themselves daily in which there is no definite proof of any dysthyroidism, but whose histories reveal sympathetic disturbance, the cause of which may be traced to the toxæmias, or to that condition which, as I[4] pointed out at our Denver meeting, has its basis in heredity or the breeding of an organism with an unstable nervous system, rather than to the thyroid gland.

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HEART DISEASE AND PREGNANCY*

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THE effect of pregnancy on the diseased heart is a problem that often worries the obstetrician. The solution is not always as simple as it would appear at first, as there are many sides to the problem. A woman who has been told that she has a diseased heart may wish to know if she may marry with safety, or, being already married, if she may have a child with reasonable assurance that she will not die or be left a chronic invalid. Another woman, already pregnant, consults her physician, who, having diagnosed heart disease, has to determine whether she can be safely piloted through the storms of pregnancy and labour into the safe harbour of motherhood. Here a new set of problems faces the obstetrician. Should pregnancy be allowed to proceed or should it be terminated? If interruption of pregnancy seems to be advisable, at what period and in what manner may it be done with most advantage to mother and child? Lastly, should the patient be seen for the first time when she is near full term, how can the case be handled with the maximum of safety?

Pregnancy exerts an unusual strain even upon the normal heart. In the later months, shortness of breath, tachycardia, palpitation, œdema of the feet, and other symptoms are not unusual, and are definite evidence of the additional burden on the circulation. It has been shown by Gammeltoft[1] that the blood flow per minute is increased by 30 to 50 per cent in the later months of pregnancy. This is attributed to the new demands made on the circulation as the general body weight increases, and the placenta, enlarged uterus and swollen breasts all need a greater blood supply, which must be drawn from the cardiac reserve. As the uterine tumour gradually increases in size, it tends to obstruct the free movement of the diaphragm, changes the shape of the chest, compresses the bases of the lungs and displaces the heart. The healthy heart does not enlarge under normal conditions of pregnancy, but, as Sir James MacKenzie was one of the first to point out, is displaced upward and to the left.

During labour the heart is under a still greater strain. There is an increase in the arterial tension owing to the straining and bearing down, and this culminates in the terrific effort of the expulsion of the child, in which the tension of the abdominal and respiratory muscles reaches its height. All these forces undoubtedly greatly increase the work of the heart, which has to draw heavily on its reserve power.

The diseased heart is not so well fitted as the healthy one to stand the long drainage of energy during pregnancy and the severe effort of childbirth, and yet there are many women with heart disease who seem to rear families without much additional damage. Consideration of the physical factors alone will not help the physician to come to the best possible conclusion in dealing with these cases. The economic and social factors should be given due consideration. There are many women whose married life would be unbearable without children, and if there is a better than average chance of their bearing children without seriously affecting their

* Read before the Section of Obstetrics and Gynæcology, Academy of Medicine, Toronto, on October 16, 1930.

health it is the duty of the physician to put all the facts before them, not letting sentiment overrule common sense, and let them make the decision if they wish to take the chance. The financial status of the family should also be considered, as a woman who cannot afford to keep domestic help during and after her pregnancy will be under a greater physical strain than the one who has servants to do the housework. The mental makeup of the prospective mother should also be carefully considered, as the neurasthenic type plus organic heart disease is a bad combination.

Let us now consider the chief types of heart disease with which we have to deal, and in what manner they may be expected to come through the ordeal of pregnancy. A rather practical grouping of pregnant cardiac cases is that adopted by Standen, Duncan and Sisson,[2] who divide their cases into four main groups according to prognosis rather than heart classification: (1) cardiac neuroses; (2) doubtful heart disease; (3) rheumatic valvular disease; (4) serious heart disease.

This is a good working classification to use in discussing these cases and I use it here.

1. Cardiac neuroses include a large group of patients who complain of breathlessness, rapid heart, palpitation, fainting, giddiness and even precordial pain, and yet in whom no trace of actual cardiac disease or any other organic disease can be demonstrated. These patients need reassuring more than anything else, and this is not easy, but if they can be convinced that their symptoms are purely functional they do very well. As someone has remarked, the anxious husband often needs more care than the wife. On the other hand, this is the type of patient who so often develops other symptoms such as insomnia, dyspepsia, pruritus and even extreme vomiting, and these complications occasionally indirectly affect the heart due to fatigue and malnutrition.

2. Cases of doubtful heart disease would include those patients with irritable hearts, frequent extra systoles, doubtful enlargement of the heart, and functional murmurs. Occasionally, owing to changes in pressure, a roughness of the first sound in the mitral area develops, and basal systolic murmurs are not uncommon. A careful examination will soon reveal that these signs are purely functional and do not signify organic heart disease. Extra-systoles need cause no undue worry and the x-ray will soon clear up any doubt as to whether the heart is enlarged or not, if percussion does not do so. These patients need cause no anxiety and can be depended upon to go through pregnancy with no ill effect on the heart.

3. This group comprises cases of rheumatic valvular disease of the heart without enlargement of the organ or any history or sign of heart failure. They include chiefly mitral stenosis and regurgitation, and aortic regurgitation, or combinations of both. Some years ago mitral stenosis, even without enlargement of the heart, was regarded as a grave complication of pregnancy and this idea has even survived in some present day text-books. The general opinion nowadays is that without definite enlargement of the heart mitral stenosis need not be greatly feared, although there is some risk of cardiac damage after pregnancy. G. H. Hunt,[3] of Guy's Hospital, compiled a very interesting series of heart cases in pregnancy, which was unfortunately not published until after his death. He had 60 cases of mitral stenosis without any enlargement, with no deaths, and only 2 cases developing heart failure during pregnancy. John Hay and E. Hunt[4] had 50 cases with no deaths.

Aortic regurgitation, on the other hand, even without enlargement of the heart, is a trifle more serious. Hunt had 25 cases with 3 deaths, 6 developing heart failure during pregnancy, and 3 with seriously damaged hearts after labour. Sir James MacKenzie[5] was of the opinion that in these cases pregnancy could be allowed to proceed if there were a good response to effort, no Corrigan pulse, and no enlargement of the heart.

4. The final group is most important from the standpoint of prognosis and management of the case. In it are placed all cases of serious heart disease, such as frank mitral stenosis or aortic regurgitation with definite gross enlargement of the heart, myocardial degenerations, congestive failure, and auricular fibrillation.

These patients, as a rule, constitute a serious problem and if seen before marriage should be dissuaded if possible, or at least warned of the dangers of pregnancy. The handling of these cases requires fine judgment and every case should be assessed on its own merits. So far

as the heart itself is concerned, the safe rule would be that if the patient is seen for the first time when already pregnant, preparation should be made at once to terminate the pregnancy, provided that she is seen early enough. Some obstetricians, on the other hand, argue that the dangers of therapeutic abortion outweigh the danger of allowing the pregnancy to proceed. In mitral stenosis, even with an enlarged heart, if the response to effort is good and there has been no history of previous heart failure, one might allow the patient to proceed to term, but in cases with poor response to effort and in the other types of cases in this group, except in the actual presence of heart failure, therapeutic abortion is, in my opinion, the safest procedure, having in mind the ultimate welfare of the patient.

In Hunt's series, out of 49 cases of mitral stenosis with enlargement 6 died and 13 developed signs of heart failure during pregnancy. In 22 cases of auricular fibrillation there were 8 deaths and 12 developed heart failure during pregnancy. Leyland Robinson[6] in a series of 18 cases of auricular fibrillation had 13 deaths. Many of these, however, were emergency admissions to the hospital who had had little or no treatment beforehand. Hay and Hunt in a series of 50 pregnant women with heart disease had only 5 deaths, all of which were due to mitral stenosis, with enlargement. They had five cases of auricular fibrillation with only one death, which was a little better than Robinson's experience. These statistics tend to show that auricular fibrillation is one of the most dangerous conditions with which the obstetrician has to deal, and presents the heaviest mortality rate in this group. In all the cases in this group, however. and in fact in any group, the state of myocardium is the important factor.

Congenital heart disease is seldom met with in pregnancy, but MacKenzie believed that these cases might safely be allowed to proceed to term if there were no clubbing, cyanosis or gross cardiac enlargement, and if the response to effort was good. A few other types of cardiac disease in which pregnancy is obviously contraindicated might be mentioned. Amongst these are acute myocardial disease, thyroid hearts, specific heart disease, paroxysmal tachycardia and coronary disease. Some clinicians have stated that hyperthyroidism only injures an already damaged heart and has no damaging influence on a heart not already affected by rheumatic heart disease, but that view is not universally accepted. In acute hyperthyroidism it has been found that it is extremely dangerous to interfere with pregnancy, and the effort had better be directed to the treatment of the hyperthyroidism alone, taking a chance on dealing with the pregnancy later. Coronary disease is seldom encountered in women of the child-bearing age, but when present should obviously prohibit pregnancy. Some patients with specific heart disease stand pregnancy well, but the number of these cases is small.

The management of the cardiac patient during pregnancy depends on the time at which she is first seen. In the milder types of heart disease described in the first three groups, careful supervision is necessary in order that no undue strain be placed on a not altogether normal heart. Certain hours of rest, particularly after meals, should be insisted on, but moderate exercise should be allowed during the early months, and, depending on the effort response, even in the later months. Diet should be supervised, and the care of the bowels and kidneys attended to minutely. With these precautions no other special measures are necessary. The cases of serious heart disease require more care. If seen prior to the fourth month, interruption of pregnancy should be advised at once if a decision is made that pregnancy would be dangerous to the health of the mother, and also provided that actual heart failure is not present. The best procedure is probably the insertion of a tent or gauze packing in the cervix, and sometimes curettage on the following day, which can usually be done under morphine and scopolomine with light ether anæsthesia.

After the fourth month, termination of pregnancy by the above means is unsatisfactory. There is a greater danger of hæmorrhage and of incomplete emptying of the uterus, and a much safer procedure is to wait for a few months, provided that the patient's condition will permit. In the fifth and sixth months, according to De Lee,[7] Cæsarean section may be done as an emergency measure. During the waiting period the cardiac reserve should be

built up. Regular medical supervision should be insisted upon and any untoward cardiac symptoms thoroughly dealt with. Rest in bed must be the chief means of conserving the patient's energy. Insomnia, flatulence, constipation, dyspepsia and other fatiguing symptoms must be eliminated if possible. The morale of the patient must be maintained at all costs. She must be kept in a cheerful frame of mind and free from apprehension, as anxiety and pessimism are two formidable obstacles to a successful conclusion of the case. As pregnancy goes on, other complications are not unusual. Hyperthyroidism in varying degrees is by no means infrequent, and speeds up the heart rate. Nephritis is also not uncommon and adds its burden to the already overworked heart.

Should heart failure occur, complete rest in bed in hospital if possible should be insisted on and the patient kept under close observation until the pregnancy is terminated. The signs of heart failure are easily detected in the early months. At this period the pressure of the uterine tumour is not a factor, so that constant crepitations in the lung bases, œdema of the feet and enlargement of the liver are definite signs of failing circulation. In the later months the œdema may be due to pressure, and the liver cannot be palpated, so that we pin more faith on the signs in the chest, but in both stages it should be remembered that the response to effort must play the chief part in helping us to estimate the cardiac efficiency.

It is extremely dangerous to induce labour during heart failure at any stage of pregnancy, but far more so in the later months. A better plan is to treat the heart failure and attempt to get the patient into as good condition as possible in the time intervening before labour is due. Cardiac cases frequently have an easy labour owing to the softness and œdema of the passages, but one cannot depend on this in every case. Occasionally miscarriage occurs at an awkward time and before the heart failure has been overcome, and indeed it is sometimes found that all therapeutic measures are inefficient in treating the failure, which often persists in spite of all treatment and lasts until after delivery.

The manner of delivery of the patient with serious heart disease has led to much discussion and is as yet a controversial subject. Each case is a problem in itself. Premature labour quite often occurs while the case is under consideration and so settles the argument. Such premature labour in these cases is probably due to the irritability of the uterine musculature because of the deficient oxygenation of the blood. Induction of labour medically or by other means at the 36th week is usually a rational and comparatively safe procedure, and after the middle of pregnancy little advantage is gained by inducing labour before this time. Some authorities, including the group at Queen Charlotte's Hospital in London, advocate Cæsarean section at the 24th week if heart failure has occurred before this period.

Cæsarean section at term, as a means of saving wear and tear on the heart, has a great many adherents and is probably the most popular method in vogue to-day, but it also has many enemies. Undoubtedly it does save the patient the severe strain of the second stage, and also furnishes an opportunity of sterilization of the mother at the same time. More conservative obstetricians, however, point out that there is the additional risk of respiratory and other post-operative complications, and even if these are avoided it is almost certain that there will be some degree of distension and a lot of pain lasting for a week or ten days, during which time the discomfort and loss of sleep often do more damage to the heart than might have been saved by avoiding the second stage of labour. In addition to this, there is the necessity, as a rule, of more prolonged deep anæsthesia.

A few points about the actual management of the labour are worthy of mention. For the anæsthetic nothing is more satisfactory than ether during the second stage. Cardiac patients stand ether very well; in fact, in some cases ether seems to have a stimulating effect, but chloroform, because of its extremely depressing effect, is contra-indicated. Mild rectal anæsthesia is of use in the early stages, but owing to the frequent occurrence of œdema of the rectum in these cases it is not always possible to use it. Sodium amytal, owing to the tendency toward excitement during the recovery stage, is not safe, and spinal anæsthesia is not safe because of the tendency toward a rapid fall in blood

pressure so often noted during its administration.

No matter how well the patient appears to be, preparation should be made for all emergencies.[7] If she has not been already digitalized, an attempt should be made to digitalize her before labour. Oxygen should be available and used early if needed at all. Interstitial saline, a venesection outfit, and loaded hypodermic syringes should be within easy reach. The effect of the pains on the circulation should be observed, and frequent estimation of the blood pressure made. It may be noted here, that the extremely flat position of the labour table is often extremely distressing to the patient, and the head and shoulders should be elevated.

When the cervix is fully dilated the membranes should be punctured, letting the fluid escape slowly. As soon as the head is down on the perineum, an episiotomy should be done and forceps applied. Should one be forced to hasten labour, owing to alarming symptoms before full dilatation has occurred, the cervix may be incised or dilated and delivery thus accelerated. The actual delivery of the child should not be too hurried and care should be taken to maintain the intra-abdominal tension by manual pressure on the abdomen, as a sudden release of pressure migh cause severe surgical shock and collapse. If there is much cyanosis and congestion of the lungs, it is a useful thing to allow bleeding to go on freely, as this is equivalent to a slow venesection and relieves the load on the right heart. In any case, I believe that ergot and pituitrin are contraindicated just at this time. Venesection proper should be done if pulmonary œdema occurs, and morphine and atropine should be administered. Even in the absence of pulmonary œdema, morphine and atropine are useful after the placenta has been expelled. Incidentally, no undue haste should be exhibited in attempting to express the placenta, and patience often pays.

The relief to the tired myocardium following the birth of the child is often immediate, but not always so, and the physician's care does not end yet. For the first twenty-four hours careful watch must be kept on the condition of the patient, as collapse often occurs suddenly hours after delivery. The careful observation should be extended to daily visits during the first two or three weeks, as not infrequently a breakdown occurs late in the puerperium just when everyone is congratulating himself that everything is satisfactory. The patient should be kept strictly in bed for at least a month after labour, and longer, of course, if indicated. I saw a woman the other day in whom at my advice pregnancy had been terminated at four months because of an advanced mitral stenosis with a greatly enlarged heart. After the abortion was done she was apparently in good condition, with no sign of heart failure. She left the hospital two weeks later against our advice and returned only a few days ago, five weeks after labour, suffering from fibrillation and congestive failure, although she stated that she had been in bed practically all the time.

The infant mortality is high in these cases of heart disease associated with pregnancy. In Hunt's series of cases it varied from 10 to 36 per cent.

The question as to whether the mother should nurse her baby depends on social as well as physical circumstances, but as a general rule, provided that she has the milk, there is no more harm in nursing the child than in fussing around with complicated bottle feedings.

In this paper I have not dealt in detail with the treatment of the various heart conditions. Briefly these would include elimination of foci of infection, treatment of acute rheumatic conditions, and the general therapeutics of heart disease. There has been no mention of the use of those two extremely valuable aids, the electrocardiograph and the x-ray, in the estimation of cardiac efficiency and prognosis. My aim has been rather to call attention to some of the main points in the management of heart disease in pregnancy.

In conclusion, it should be remarked that it is not wise to take too gloomy a view of the situation when one is confronted with a patient late in pregnancy in whom there is evidence of severe heart disease. It is astonishing how many women with apparently severely diseased hearts come through repeated pregnancies with remarkably little additional damage.

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THE LATE SEQUELÆ OF AN ASEPTIC ABDOMINAL OPERATION

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THE purpose of this paper is to deal with some of the annoying late sequelæ of an aseptic abdominal operation. The discussion will be confined to a review of these after effects, with special reference to some measures which from my own personal experience have tended to minimize or even prevent some of these discouraging results. We may assume that the indications for the laparotomy were definite, and that the technique employed by the surgeon in correcting or eradicating the disease was a recognized and accepted procedure. Mistakes in pre-operative diagnosis, and errors in surgical judgment or technique, do not therefore enter to any great extent into the scope of this article.

The term *aseptic operation* is of course, strictly speaking, incorrect. It is impossible to attain this ideal, and, furthermore, we know from experience that it is not necessary. Fortunately, nature seldom demands 100 per cent perfection. We rely, at this point, on the normal defensive mechanism of the peritoneum, which is considerable, as we later depend upon the physiological reserve and functional elasticity of the different abdominal viscera to assist us in overcoming the effects of disease. Micro-organisms enter the operative field from the air. Lister tried to sterilize the air by spraying the operating theatre with carbolic acid solution. In the modern theatre this source of contamination is minimized by the surgeon and staff wearing masks. The skin normally harbours a large number of pathogenic and non-pathogenic organisms. We do not sterilize the skin, but we can reduce the number of these organisms by thorough pre-operative cleansing of the skin surface, and further render the remaining organisms less virulent by using antiseptic solutions such as iodine or mercurochrome. Some intraperitoneal contamination occurs with most major operations on the gastro-intestinal tract (excision of ulcers, gastrectomies and entero-anastomoses, etc.), but fortunately the peritoneum handles this, providing the dose and virulence of the organisms have not been excessive. In preventing frank infection we employ a combination of aseptic and antiseptic measures.

The second factor of importance is tissue injury from unnecessary and rough handling, with resulting adhesions. There can be little doubt but that in the development of post-operative adhesions there exists a wide variation in individual predisposition. Some patients develop widespread peritoneal adhesions in spite of the most scrupulous care; others again recover from a severe intraperitoneal suppuration, with very few adhesions. *From the standpoint of late symptoms the incidence of post-operative adhesions has been greatly over stressed.* Post-operative adhesions, like congenital bands, can be a convenient diagnosis, but one which is usually incorrect and rarely explains the cause of chronic intra-abdominal disorders. Fifteen or twenty years ago operations for adhesions were common. To-day we practically never see a case slated for operation with this diagnosis. *Unless the adhesions produce a degree of obstruction they should be ignored.* In spite of this, however, every possible care should be taken to minimize the trauma incident to a laparotomy. Spinal anæsthesia, in providing complete muscular relaxation and collapse of the intestine, is of great assistance in lessening trauma.

The "missing sponge" needs no comment, though an entirely satisfactory solution for its prevention has not yet been found. The accident still happens occasionally. I have removed one from a closed abdomen and two from abdominal sinuses.

THE INCISION

An incisional hernia with its consequent discomfort and disability deserves special consideration. The ideal incision allows, first, an easy access to the viscera involved, and, secondly, firm closure without undue tension.

The first requisite does not necessarily mean an exploratory incision in every case. In fact there are many instances in which a large incision is definitely contraindicated and is calculated to prolong the post-operative convalescence, increase the risk of hernia, and only serves to satisfy the curiosity of the surgeon.

The incision for the removal of an acutely inflamed appendix is a contentious subject. Some surgeons tell me they never use a muscle-splitting incision (the so-called McBurney's or gridiron incision), and I use practically nothing else. I admit that the occasion may arise when it becomes necessary to enlarge or change the incision, but this should rarely occur. I have had to resort to some other method only twice in the last two hundred cases. On one occasion where the tip of the appendix was attached to the right edge of the liver, I made a second small muscle-splitting incision, freed the tip, and passed it out of the lower opening, rather than cut the muscle to obtain access to it.

I would like to relate here one unfortunate surgical sequela that came under my observation. A medical officer of the Canadian Army was operated on for duodenal ulcer by a noted surgeon. An x-ray examination or gastric analysis had been deemed unnecessary. No ulcer was found at operation, but a diseased appendix was removed. After one of my clinics at the Winnipeg General Hospital he asked me to look at his wound which had given him so much trouble that he was considering having it operated upon. The scar extended from the tip of the sternum to two inches below the umbilicus and was two inches wide in the centre. The umbilicus was well to the left of the midline and the whole right side bulged unduly. This gave him great distress. I doubt that his primary suffering was greater than the discomfort caused by the rupture. *A long incision should not replace careful pre-operative investigation.*

A mid-line incision, so favoured by gynæcologists, is the most likely of all to be followed by an incisional hernia. A para-median incision, made from one-half to one inch either to the right or left of the mid-line, with the inner border of the rectus displaced laterally, gives equally good access to the pelvis and lends itself to stronger closure. The replaced rectus muscle acts as a buffer between the suture lines in the posterior and anterior sheaths of that muscle.

After using the vertical type of incision for many years for the surgery of the pylorus, duodenum and biliary passages, I now use the Kehr incision (oblique, one inch below the costal margin) almost exclusively for operations in this region. A similar incision on the left side is preferable to a longitudinal incision in operations on the cardiac end of the stomach, the spleen and in transperitoneal renal operations. Not only is the incidence of post-operative hernias reduced by the Kehr incision, but it has been contended by some New York observers that post-operative pulmonary complications are lessened, the breathing being less embarrassed following the use of oblique or transverse incisions. With the patient propped up in bed, tension on the sutures is absolutely relieved. I have observed frequently in repairing an incisional hernia that the opening in the abdominal wall could be closed, and sometimes the edges of the fascia overlapped, in a transverse direction with very much greater ease than in the vertical, notwithstanding the fact that the primary incision was longitudinal.

SUTURE MATERIAL

Closure of the abdominal incision in such a way as to prevent spreading and subsequent hernia is important. For the suture of all abdominal wounds we use chromic catgut No. 1, doubled, both for the posterior and anterior suture lines (peritoneal layer and aponeurosis). In the longitudinal incision these continuous sutures are reinforced by two-strand figure-of-eight silkworm gut stitches. Two, three or four of these are used, depending on the length of the incision. The outside loop is passed through a small rubber tube which prevents the stitch cutting the skin. The stitches come out very readily on the twelfth or fourteenth day. From our experience we are in a position to say that this method of re-inforced suture is practically an absolute guarantee against immediate post-operative opening of the wound with protrusion of intestine, and reduces the incidence of late incisional hernias.

It is strange that some operators use silk so freely, I was going to say lavishly, while others

use it not at all. I have records of eight cases in which, as the result of using buried silk (in two cases silkworm gut), serious invalidism followed, resulting in incapacity for from seven months to two years. All of these cases developed pain and sinus formation some time subsequent to a "clean" operation, and had to have one or more anæsthetics for the removal (in some cases with difficulty and not without danger) of the non-absorbed sutures or ligatures. Non-absorbable buried sutures or ligatures are practically never used in our practice. We have yet to see the case in which absorbable suture material could be entirely blamed for some immediate post-operative emergency such as hæmorrhage. This is more likely due to the ligature being insecurely applied than to the material used.

POST-OPERATIVE PERITONEAL ADHESIONS

Apart from incisional hernias, one of the worst results that may follow an aseptic operation is acute intestinal obstruction. This may occur at any time after operation, but is always hanging like the sword of Damocles over the head of every individual with post-operative adhesions. No successful method of avoiding this catastrophe has as yet been discovered. It therefore behoves us as surgeons to do the work on the abdomen with the least possible insult to the tissues, especially the peritoneum, and that each operation be completed as by an artist and not an artisan.

Intestinal obstruction may follow the simplest abdominal operation. The following case serves to illustrate this point.

A young man in his twenties had been suffering from stomach disturbance and vague abdominal pains for nine months. His appetite had been poor and he complained of some flatulence, pyrosis and sluggishness of the bowels. The general examination was negative and an abdominal examination revealed tenderness in the appendix area. Urinalysis was normal; gastric acidity was normal; the x-ray excluded ulcer and new growth; the gall bladder was visualized normally (Graham method). The diagnosis was chronic appendicitis with secondary gastric disturbance. There was nothing to suggest anything else in the history or examination.

I removed the appendix, which showed definite pathological changes, through a small muscle-splitting incision large enough to admit the left index finger. A purse-string of No. O chromic gut inverted the appendix stump. No packing was used and the small intestine was not seen or handled.

On the eighth day when the patient was out of bed he developed abdominal pain and vomiting. This persisted and enemas were ineffectual for gas. The diagnosis was acute intestinal obstruction. The pain being in the left abdomen I made a left para-median incision. Nothing abnormal was found on the left side, but the right lower corner of the great omentum had become adherent to the point where the appendix had been removed and pulled tightly across the ileum at its junction with the cæcum. This was freed. Subsequent recovery was uneventful.

SPECIFIC OPERATIONS

Peptic ulcer.—Although some contamination of the operative field with gastric or duodenal contents invariably occurs, yet the unfavourable results following operations for peptic ulcer are not usually due to sepsis, as the wounds invariably heal by first intention. The poor results in these operations are due to failure in technique, or improper selection in the operative procedure in the individual case. The most dreaded sequela is a "stoma ulcer" following gastro-enterostomy. The patients' symptoms are the same as before, except for the location of the pain, which is to the left of the mid-line. Experience has shown that gastro-jejunal ulcers occur more frequently in the younger group of patients and therefore age is a definite factor to take into consideration. From some hospital statistics it would appear that recurrent ulcers are more common in the Hebrew race.

Whereas a posterior gastroenterostomy was the operation of choice for duodenal ulcer, it is now reserved in our practice for cases in which a local operation on the pylorus and duodenum, such as the Finney or Judd operation, cannot as safely be done. The ideal procedure is to remove the ulcer with the ulcer-bearing area of the duodenum, eliminate pylorospasm by partial pylorectomy, as in Judd's technique, and to provide free communication between the stomach and duodenum—a natural internal alkalinizing process. Out of 22 cases in which I and my associate, Dr. Thorlakson, have done either the Judd or the Finney operation, the results have been, with one exception (Judd excision) satisfactory, and we are using these methods more in selected cases. This patient had heartburn, gas and occasionally vomiting. There was one death from pulmonary embolism on the sixth day.

Following these pyloroplastic operations a recurrent ulcer may develop. This recurrence is fortunately not so frequent as the occurrence of stoma ulcers after gastro-jejunostomy. I have had one case, however, following a pyloro-duodenal operation operated on elsewhere, and

was able to positively demonstrate the ulcer at operation. In this case a posterior gastro-jejunostomy was done with entire relief of symptoms. Another patient that came under our observation had hæmorrhage at intervals following the excision of a duodenal ulcer. Probably an ulcer on the posterior wall ("kissing" ulcer) was overlooked. One of the chief advantages of these pyloroduodenal operations is that the local lesion can be examined and dealt with directly. Furthermore, it has been shown that in cases of peptic ulcer where hæmatemesis has been a symptom, gastro-jejunostomy alone does not suffice. The ulcer must be excised as well. Elimination of non-absorbable suture material, avoidance of trauma with gastro-enterostomy clamps, and improved operative technique have eliminated many of the late sequelæ of ulcer surgery.

Appendicitis.—The function of the appendix is such that (like Ko-Ko's social offenders, who "never would be missed") it never should be missed. The only possible sequelæ that could follow a clean appendectomy would be those due to post-operative adhesions. These may be manifested by annoying nagging pain, constipation, or even intestinal obstruction. An ideal operation removing the appendix through a muscle-splitting incision, well out to the side, with no handling of intestine except the caput cæci, usually is followed by no adhesions. In one case that had persistent pain and a tender cæcum following appendectomy, I found the stump of the appendix adherent to the incision area. The surgeon who removed the appendix did not believe in turning the stump into the cæcum by purse-stringing or suture. I think it wise also to carefully replace the viscera in their anatomical position in the abdomen rather than just to let them drop in when the operation is completed as is so often done. Had the cæcum been carefully pushed back, the stump of the appendix would likely have attached itself to the posterior wall where the cæcum is normally fixed, rather than to the anterior abdominal wall where it did not belong, and where dragging on the peritoneum was more likely to cause pain.

Gall bladder.—Within the scope of this paper one can only mention briefly some of the chief causes for failure in surgery of the biliary tract. The relative merits of cholecystectomy and cholecystostomy have repeatedly been discussed. Many theoretical arguments, based on sound physiological grounds, can be advanced in support of simple drainage. We have records of two patients who had stones removed and the gall bladder drained, whose gall bladder function appeared normal subsequently, as judged by the Graham-Cole technique (J. Currie McMillan, radiologist). However, the high percentage of recurrence following drainage, by reason of the difficulty in clearing the cystic duct of minute calculi, is the chief argument in favour of cholecystectomoy. Infection in the wall of the gall bladder which cannot be eradicated by drainage is an added reason for its removal. The sequelæ may be considered under the following headings.

1. A stone overlooked in the common duct is the most common cause of recurrence of symptoms. The absence of a history of jaundice should not be taken as sufficient grounds for excluding this possibility. One of our cases had fourteen stones in the common duct with no history of severe colic or jaundice.

2. Injury to the common duct during ligation of the cystic duct can only be prevented by careful dissection and exposure of the cystic duct before the application of forceps or ligature.

3. Adherent pylorus interfering with normal gastric mobility. This can be avoided by placing omentum between the gall-bladder area and the pylorus, and by directing the drainage tube outwards to the right instead of across the duodenum and pylorus.

4. Overlooking a duodenal or gastric ulcer in the presence of marked gall-bladder disease. Cholecystitis and peptic ulcer are not infrequently associated. Careful inspection of the stomach and duodenum should never be neglected, no matter how definite the gall-bladder lesion appears. In two cases I have found and removed an ulcer on the posterior wall of the stomach that had not been demonstrated by the x-ray but was associated with gall stones.

5. An associated pancreatitis or diffuse hepatitis is simply an evidence of widespread inflammatory involvement which requires prolonged drainage of the common duct. The patient, furthermore, requires extended medical observation and dietary regulation. Where a diffuse and pronounced pancreatitis is dis-

covered, associated with a cholecystitis, the patient should be considered a potential diabetic and treated along these lines.

Colon dysfunction.—Functional disorders of the colon can mimic almost any intra-abdominal lesion and are probably the cause of more discomfort to the patient and more worry to the medical attendant than all other considerations combined. After excluding organic lesions that have been overlooked, the most common cause of persistent pain or abdominal discomfort following laparotomy is this functional disturbance. This bowel dysfunction may be allowed to develop as a result of inadequate dietary and medical supervision during the period of convalescence. Post-operative care in abdominal surgery cannot be overstressed.

ADVANTAGES AND DISADVANTAGES OF NUPERCAINE*

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IN June, 1929, the first of a series of papers dealing with a new local and spinal anæsthetic, prepared by the Society of Chemical Industry in Basle, appeared. This new anæsthetic is known as nupercaine. We received a sample of this drug early in the year at the Department of Pharmacology, and carried out a series of tests with it. We studied its effect when used (1) intravenously; (2) subcutaneously; (3) intraspinally; (4) for nerve block; (5) as applied to the cornea. It seemed to us that used locally and as a spinal anæsthetic, it had two distinct advantages over the usual preparations in that its anæsthetic effect lasted a long time and sensation was recovered slowly. We followed up our laboratory work by beginning a series of spinal anæsthetics at the Toronto General Hospital, using nupercaine largely for abdominal surgery.

In going over the literature, largely from Europe, where nupercaine was used for two years before any clinical use was made of this drug in America, we found a list of the following cases; 200 spinal cases; 2,000 minor and major operations performed under nupercaine used as a local anæsthetic; 1,000 operations in nose and throat work, using nupercaine.

Reading through these we find repeatedly such facts as these: (1) In no case was there any tissue damage and, if anything, healing seemed to take place more rapidly when nupercaine was used as compared with other local anæsthetics. (2) In spinal anæsthesia there were never any irritant effects on nerve roots or cords. (3) There has been no evidence of impaired conduction or neuritis after nerve block.

I shall speak first of some of the disadvantages of nupercaine as used intraspinally for abdominal surgery. These remarks apply chiefly to the 1:1000 solution, although the same is generally true of most of the nupercaine solutions used.

1. The time required for nupercaine to act is 10 to 15 minutes.

2. The specific gravity of the 1:1000 solution is lower than that of spinal fluid. There are several important points of technique to be careful about. First, there will be while the patient is in the dorsal position a tendency for the anterior roots to be affected much more than the posterior, and thus the abdomen will be flaccid but sensitive to pain. Also the slight Trendelenburg position is necessary because this prevents the anæsthetic rising to affect the nerves supplying the intercostal muscles and finally the phrenic nerve, which is perhaps more apt to be affected than with novocaine, on account of the preponderating anterior root effect. However, these two disadvantages are turned into advantages by having the patient lie face downward for 5 to 10 minutes after the injection is made and thereafter seeing that the head is slightly lowered.

3. *Headaches.*—We have felt that we had too many headaches. Number of cases, 12; number

* Read before the Section of Anæsthesia, Academy of Medicine, Toronto, October 27, 1930.

of headaches, 8; number of severe headaches, 3. H. Jones, who reports 100 cases, does not mention headache as occurring too frequently. Keyes and McMillan, with 46 cases, mention only one case of spinal headache. From reading the accounts of these and many others in Europe, it is my belief that by raising the foot of the bed after operation and keeping the patient in that position for a longer period than with novocaine, our apparently rather large percentage of headaches would be greatly lessened.

4. It is well to remember that when a solution of nupercaine is made in normal saline a slight cloudiness may develop where traces of soda bicarbonate are present with the NaCl. This cloudiness is due to separation of the nupercaine base. The same phenomenon may rarely be seen also when alkaline glass is used. This cloudiness can be prevented or caused to disappear by addition of 1 to 3 drops of dilute HCl to each 1000 c.c. of solution before administration.

5. In the case of large ovarian tumours there may be some danger in placing the patient in the ventral position due to possible aortic compression or general increase in intra-abdominal pressure.

6. The potency and efficacy of nupercaine is something to remember. The dangers of overdosage are practically non-existent if the therapeutic doses are given.

As regards blood pressure we found the following results in 12 cases:

	Number	*Ave. fall in B.P.*
Cases given ¾ gr. Ephedrin and Double Sedative ...	7	7.7
Cases given ½ gr. Ephedrin and Single Sedative ...	4	12.5
Cases given ½ gr. Ephedrin and Double Sedative ...	1	20.0

The advantages of nupercaine are as follows: no nausea or vomiting on table (none in our 12 cases; length of anæsthesia; slow return of sensation; slight antiseptic properties; no definite evidence of any reaction due to a personal idiosyncrasy as occurs with cocaine; not habit forming; low concentration of drug — which means slower absorption into the blood stream; much cheaper than cocaine or novocaine.

DIATHERMY*

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VII

IT is a well known fact that a conductor can be heated by passing an electric current through it, but it is less familiarly known that the human body can be heated in the same way. If it is traversed by a special form of electric current its temperature can be raised. Certain organs and regions can be heated to the highest temperature that the tissues can tolerate without harm. It is possible, in fact, to heat small portions of tissue to a temperature high enough to coagulate them and deprive them of life.

It may now be asked if any advantage is gained by employing the electric current to heat the tissues, in place of a hot water or hot air or radiant heat. The answer is strongly in the affirmative. When the electric current is used, the tissues are heated "through-and-through", when the other methods are employed they heat only the superficial regions of the body. The electric current heats the *deep,* as well as the *superficial* tissues; hot air, hot water, and other hot objects placed in contact with the skin, or at a distance from it, heat the superficial tissues alone.

A few moments' consideration will furnish the reason for the statements just made. The tissues are slow conductors of heat. When a hot object is placed in contact with the skin the heat penetrates slowly through the epidermis, reaches the vessels in the dermis, and is carried away

* This is the seventh in the series of articles published in the *Canad. M. Ass. J.*, dealing with Physio-Therapy. The preceding papers will be found in 1931, **24**: 263, 409, 539, 679, 831, and **25**: 65.

by the circulating blood. Radiant heat waves are stopped in the dermis, and they heat this part only. When the electric current is employed it passes through the body; the tissues offer some resistance to its passage and are therefore heated, just as any non-living resistant conductor is heated when it is made the path of an electric current. The heat is generated on the path of the current in the tissues. On the other hand the heat derived from hot external objects is, as it were, "ready-made", and the only way it can get into the tissues is by conduction or radiation. The electric current, however, passes through the body and actually generates heat within the tissues. Heat which is generated in this way and distributed throughout the tissues is known as *diathermy*. Heat derived from other sources, "ready-made", and distributed in the superficial regions only, might be termed "epithermy."

It is now necessary to consider the kind of current which will heat the tissues through and through, *i.e.*, produce diathermy. Currents like the faradic, galvanic and sinusoidal are quite unsuitable for the purpose, because they would produce unbearable contraction of the muscles, and dangerous chemical changes within the tissues long before they reached a strength sufficient to heat the body. It is necessary, therefore, to deprive the current of its power to stimulate muscle and nerve and to produce chemical changes. This can be done by making it alternate, or oscillate, about a million, or nearly a million, times per second. This is known as a *high-frequency* current. Not all high-frequency currents, however, will produce a perceptible diathermy. The original type of generator constructed for medical use produced so little heat that it escaped notice by all save a few noted pioneers; the latter, too, did not attribute any of the observed therapeutic effects to the heat. The way in which these effects were obtained was not explained until the importance of the heat was realized. They were due to the small amount of heat generated by the high-frequency current from the original apparatus. Modern machines produce currents which attain a higher amperage and are more suited for heating the tissues many degrees. The currents are known as *diathermy currents*.

Now, in regard to the therapeutic properties of the diathermy current, it must be said that they are the properties of heat, and of heat only. It serves no useful purpose, at present, to presuppose that the current has actions other than the production of heat. The effects of heat are far-reaching. By means of the diathermy current the power of heat to relieve pain and spasm, to aid resolution of inflammation, and to assist the tissues in freeing themselves from infection, can be brought about in regions which are beyond the reach of other thermo-therapeutic agents. The therapeutic field of diathermy is therefore a wide one. Diathermy will cure or relieve the diseases or symptoms which can be cured or relieved by other forms of thermo-therapy, and some of them more quickly. But there are many cases of various diseases which can be cured or relieved by diathermy only.

It is in the treatment of certain diseases of the pelvic organs in women that diathermy has made the most far-reaching advances. By introducing a special electrode into the urethra and completing the circuit by means of a pelvic belt electrode the part mentioned can be heated to 114° F. (the maximum bearable without pain), and freed from infecting gonococci, in about 90 per cent of the cases. The same is true of the cervix uteri when treated in a similar manner. If the infection is non-gonococcal it can be removed in about 80 per cent of the cases. If metastatic infection of the joints or fibrous tissues is present, the removal of the infection from the cervix will at the same time bring the arthritis or fibrositis to an end. By means of a special vaginal electrode it is possible to terminate infection of the Fallopian tubes and the pelvic supporting tissues in the great majority of cases, gonococcal or otherwise. Congestive dysmenorrhœa can always be cured by diathermy, but the spasmodic type is only temporarily benefited.

In male subjects the prostate and vesicles can be subjected to diathermy by way of a special rectal electrode. This treatment will always bring gonococcal arthritis or fibrositis to an end. There is evidence which favours the conclusion that the prostate and vesicles themselves are likewise freed from gonococci. In anterior urethritis diathermy has no special value, but in gonococcal epididymitis and orchitis its action is remarkable. Pain is relieved during the first application; after three

treatments and the expiration of ten days all the tenderness, pain and swelling disappear. The response of this disease to diathermy is one of the most constant phenomena in therapeutics.

There is sufficient evidence, now, to show the value of cardiac diathermy in angina pectoris. In cases where the pain is sudden in onset the effect of the treatment is to diminish the frequency and severity of the attacks until the pain is only slight and at rare intervals. A few cases appear to have been cured. In cases of hyperpiesia the action of diathermy is to lower the blood pressure and relieve the symptoms. The blood pressure, if very high, can be maintained at a reduced value for long periods.

In some cases of chronic bronchitis the application of diathermy to the chest procures long-lasting relief. The same results have been obtained in some cases of idiopathic asthma. In lobar pneumonia the effect of diathermy has been much discussed. There is no doubt that it can relieve pain and procure sleep after other methods have failed. Whether it lowers the mortality-rate has not yet been settled in England, though the work of H. Eaton Stewart, in the United States, seems to show that the death rate can be reduced.

In mucous colitis diathermy is of high value. One electrode is placed in the rectum. The other, a lead belt, is placed around the pelvis. The frequency of defæcation diminishes and the consistency of the stools improves until, after 4 to 6 weeks, the normal condition is regained. Relapse may occur, but permanent results may be obtained after further courses of treatment. The pain due to anal fissure can be quickly relieved by diathermy.

Diathermy is of considerable value in surgery. Both innocent and malignant growths can be heated by the current and their temperature raised until the tissue proteins coagulate. The advantages of this form of treatment are the following. There is no disturbance of the anatomical continuity of the growth; no cutting or scraping and no loss of blood. The vessels are sealed. The importance of this is obvious when the growth is malignant. The patient does not suffer from shock after the operation. After the destroyed tissue has sloughed away, the cavity quickly fills with granulations, and the final scar does not shrink or form adhesions with adjoining parts.

The temperature necessary to procure coagulation is brought about by reducing the size of the active electrode (which is placed in contact with the growth) to that of a small disc, button or needle. As a result, the density of the current within the growth is increased sufficiently to heat the tissue to the temperature of coagulation. If a malignant growth is eradicable the best plan is to use a needle electrode, insert it in the healthy tissue adjoining the growth, and produce a layer of coagulated tissue all around the malignant part. This can be done by repeated insertion in closely adjoining parts. In this way the growth can be imprisoned in a "rampart" of coagulated tissue. A portion can then be excised with safety for microscopic examination. and the remainder coagulated *en masse*, or excised by the cutting current (see below). When a disc or button is used it is difficult to control the depth of coagulation.

The latest development in the use of high-frequency currents in surgery is their employment for the excision of growths. A blunt needle is used as an active electrode. The generator is set in operation and the end of the needle brought in contact with the tissue. Just before it makes contact a minute electric arc appears in contact with the skin. The needle can now be inserted and drawn along the tissues. It divides them like a scalpel, but without any effort on the part of the operator. At the same time the divided surfaces are coagulated to a depth of 0.1 to 0.5 mm. The microscopic vessels are sealed. In other words a "dry cut" is obtained. Larger vessels are not sealed, but the bleeding can be quickly stopped and their ends closed by seizing them with a forceps and passing the current along the latter. In a few moments the cut ends are coagulated. No suture is needed. Wounds made by the cutting current will heal by first intention when they are sutured, and post-operative shock is less than that which follows operation with the scalpel. It is obvious that the automatic sealing of capillaries and lymphatics is of advantage in operations on malignant growths.

Mention must also be made of another of the so-called *electro-thermic* methods of surgery. This is the treatment known as "fulguration"

or "dessication". It consists of the destruction of abnormal tissue by means of sparks derived from a diathermy current generator. The sparks dry, rather than burn, the tissue. The reaction following is unnoticeable, and the scars are the best obtainable. The treatment is valuable for papillomata of the skin and accessible mucous membranes, moles, superficial nævi, lupus nodules and some epitheliomata of the skin.

The preceding pages give an all too brief introduction to a most important subject. If the reader is stimulated to employ diathermy in the treatment of the diseases above-mentioned and to master the technique the purpose of the present paper will have been fully achieved. The author writes from his own practice and experience. Diathermy was first employed in England at St. Bartholomew's Hospital, and the methods of subjecting the pelvic organs to its influence were devised in its Electrical Department.

THE OPERATIVE TREATMENT OF FRACTURES*

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THIS title presupposes that there is a non-operative treatment of fractures, and I would like to emphasize the fact that the majority of fractures, properly handled, should come within the non-operative class. Any treatment, whether operative or non-operative, should have for its object the restoration of function, and, to obtain this, a good anatomical result should constantly be sought for.

The Fracture Committee of the British Medical Association, in a report published in the *British Medical Journal*,[1] states as follows:

> "An analysis of all the results, non-operative and operative, clearly shows the interdependence of the anatomical and functional results. The total number of cases in which a good anatomical result was obtained is 1,736, and in no less than 1,576 of these, the functional result was also good. In other words: If the anatomical result is good, the functional result is good in 90.7 per cent. If the anatomical result is bad the functional result is bad in 53.3 per cent."

When a bone is fractured, there occurs, immediately following the solution of continuity, a period of increased local vascularization. New osteoblasts and fibroblasts are poured out from the torn periosteum and endosteum through the Haversian canals and deposited between the ends of the fragments, thus building a bridge between the ends of bone. Following this, there is a period of diminished vascularity and absorption, and a sclerosing process goes on which results in the fractured ends taking on an ebonized appearance, with shrunken Haversian canals and a proportional increase in the dense portion of the bone. The ideal method of treating a fractured bone will use this knowledge and try to promote the healing process in such a way as to restore the injured bone to as nearly a normal state as possible.

The operative treatment of fractures includes any method which involves the exposure of the seat of fracture, the direct reduction of the deformity, and the fixation of the parts by use of wire, plates, screws, pegs or grafts. The use of any of these appliances has for its object the securing of good anatomical relations, in the hope that normal function may be restored.

Certain classes of cases come within the field of operative treatment: compound fractures; simple fractures where a good anatomical result cannot be obtained by non-operative methods; cases of pseudo-arthrosis; certain cases of malunion; gap fractures.

SURGICAL TREATMENT OF COMPOUND FRACTURES

The treatment of compound fractures is a definite surgical problem. The combined views of many observers who have had an enormous amount of experience in treating these cases in recent years now enables the profession to place the treatment of these cases on a sound basis. Certain well established facts should be

* Read before the Academy of Medicine, Toronto, on March 3, 1931.

borne in mind. (1) These cases are almost always infected. (2) Bony union may take place in the presence of septic infection if the bone fragments are kept in apposition, and at rest. Some attention will therefore have to be paid to combat infection. Complete débridement of the wound should always be done under general anæsthesia, and done as early as possible. Reduction of the fracture should be done at the same time. Dependent drainage should be established. Wound sterilization should be carried out by the Carrel-Dakin method, until the wound is surgically clean. Absolute immobilization of the fractured limb should be obtained, and maintained by use of some such appliance as a Thomas' splint, if a lower extremity, or a Jones' splint, if an upper extremity. These splints, if properly applied, will enable the wound to be dressed without disturbing the fragments. Often after following this plan of treatment union will result when not expected.

The plating of compound fractures has been recommended by some, but the method appears to be fraught with needless risks. Reduction and immobilization can be secured by means of traction, posturing and secondary splinting. The application of an extensive operation such as plating in the face of sepsis would seem unjustifiable. Hey Groves, in his work on "Modern Methods of Treating Fractures,"[2] states:

> The wise rule will be never to operate on an open fracture until the wound has soundly healed. This may be two weeks of the injury, when the wound has been treated by primary excision and suture; or it may be a much later date, if the wound has healed by granulations. In the later case, if the original infection has been severe, so long a time will be required for the tissues to become free from latent infection that union of the bone will have taken place long before the open operation can be attempted. Therefore the main treatment of the fracture must be by an external traction.

OPERATIVE TREATMENT OF SIMPLE FRACTURES

Where a good anatomical result cannot be obtained by non-operative methods, operation is clearly indicated. If the proper time is chosen for operation, the operation done in proper surroundings and with proper surgical technique, the risk is not very great. For several days immediately following a fracture the local inflammatory reaction is quite severe. Blood is poured out within the periosteum, and perhaps into the surrounding tissues. There is marked swelling on account of the extravasation of leucocytes in the local area about the fracture. During this period, operation is better avoided, as infection is very likely to follow. This period might better be utilized in attempting to reduce the fracture by posturing and traction by various methods, including the use of such aids as Kirshner's piano wire extension or calipers. If the various methods of reducing a closed fracture fail to show a good anatomical result by the time local inflammation has subsided, operation should be proceeded with. This is still within the period of the most favourable time for securing union, as the ends of the bones are fresh, the Haversian canals have not yet been closed, and sclerosis has not yet commenced. The objects of operation are to obtain and maintain reduction of the bone fragments.

The Fracture Conference of the American Medical Association held in Boston in April, 1922, reporting their findings in the *Archives of Surgery*,[3] state as follows:—

> Operative treatment is indicated when satisfactory reduction cannot be obtained and maintained by non-operative methods . . . and when the expected result of the open method is sufficiently better than that of the closed method to justify the additional risk.
>
> It is generally recognized and accepted that in certain types of fracture it is impossible to obtain satisfactory restitution except by operative methods.
>
> The operation method is recommended to those surgeons who have the necessary skill and judgment, and who have the hospital facilities and surgical armamentarium with which to do this work properly. In case of those who do not have such facilities, operation is not advised.
>
> Internal splinting of the long bones is usually best made by fixation with steel plates and screws having a maximum strength and minimum ductility. The machine type of screw only should be used. The wood, or so-called carpenters', screws are contraindicated in the cortex of the bones.
>
> A scrupulous non-hand contact technique should be carried out with strict attention to detail. The skin should be carefully covered during the operation, and there should be special care and preparation of the skin before operation.
>
> Intra-medullary bone graft or splint is contra-indicated if any other method is possible. Bone-grafting is indicated chiefly in loss of substance and pseudo-arthrosis. It is not indicated in the treatment of acute fractures.

Coming as it does from such high authority, this summing up must be taken as conclusions resulting from modern study.

It is my practice to remove plates before the patient leaves hospital, an operation which is fraught with little risk and rids the limb of a foreign body which may later on prove a source of irritation and a possible focus of infection. Plating should be considered an adjunct to other methods of secondary splinting, which

should be utilized in maintaining reduction. Otherwise, angulation from muscle pull may result, with serious deformity, loosening of the plate, and perhaps malposition of the fragments. (Figs. 1, 2, 2a and 3.)

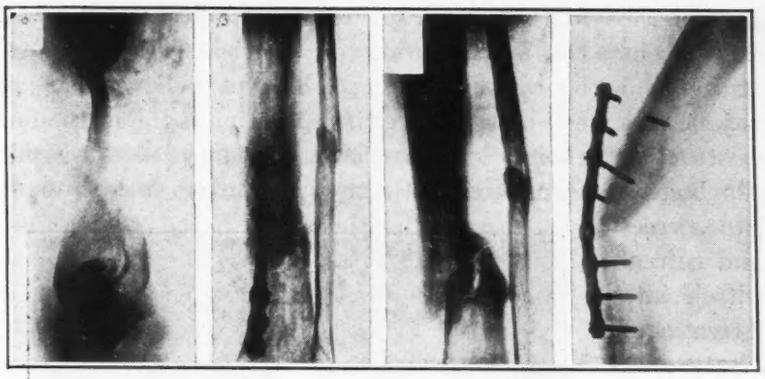

FIG. 1 FIG. 2 FIG. 2a FIG. 3

FIG. 1.—Useful union in a badly comminuted compound fracture by using conservative methods.

FIGS. 2 AND 2a.—Lane's plates still serve a useful purpose in certain cases.

FIG. 3.—Poor posture may prevent a bone plating operation being a success. This illustration shows the importance of correct posture.

THE TREATMENT OF NON-UNION AND MAL-UNION

Every effort possible should be made to stimulate osteogenesis in a case of non-union where fragments are in good position before operative methods are undertaken. In order that we may have a clear idea of the pathological condition met with in non-union, a brief review of the causes of this condition may be of assistance. Non-union may result from certain mechanical causes, e.g., excessive traction, want of apposition of fragments, interposition of muscle or fascia, or repeated movements of the fragments. It may be due to certain inflammatory causes, *e.g.*, sepsis or necrosis. It may be due to fibrocystic disease of the bone, or to neoplasms. A triple-plus Wassermann reaction will explain lack of union in some cases, and, according to Tisdall and Harris,[4] in cases of non-union there is an abnormally low calcium and phosphate content of the blood serum.

Careful consideration of the various causes of non-union in relation to the case to be treated may be of assistance. Excessive traction is most often seen to be the cause of non-union in fractures of the humerus, the patella or the olecranon process of the ulna. In fractures with gross displacement the main fragments may be so angulated that they have no point of contact. Fascia or muscle may be interposed in such a way as to prevent the fragments from coming into contact, and may remain in this position after the displacement has been corrected, and so prevent bony union. The constant disturbing of the two fragments of a fractured bone will not in any way prevent callus formation, but the continual movement will fracture the new osteoblasts, and prevent a connecting bridge being formed between the two fragments. The rotary movements which go on in an incompletely immobilized fractured humerus, which are usually the cause of non-union in this bone, are a good illustration of this. In infected cases, where the sepsis is of an active nature and the tissues have lacked proper drainage, the Haversian canals of the bone may become closed and prevent the escape of osteoblasts. Actual necrosis of bone at the seat of the fracture will cause delay or failure of union. One of the most potent factors of all is sclerosis.

A broken bone goes through the following steps in the process of repair. There is first absorption and extra-vascularization, followed by sclerosis with diminished vascularity. If for any reason the sclerotic or avascular stage has been reached before union has taken place, union may be prevented. Hence, where there is a gap between the ends of the fragments, or poor apposition, or mobility takes place, or sepsis occurs, the sclerotic stage may be reached before union has taken place.

In the treatment of non-union, this sclerotic stage of the bone-ends may be an important factor to bear in mind; it is also an important factor to bear in mind in treating cases of mal-union. In estimating whether a given case of mal-union should be operated upon or not, several points must be kept in mind, and the mal-union must be considered from more than one point of view. The condition of the bony fragments in their relation to each other must be considered, and the deformity in its relation to the whole limb, including the effect of the deformity on the joints of that limb. Only mal-union affecting the utility of the limb should be operated upon.

In examining the fragments in relation to

each other, we may find them in a position of angular deformity, rotary distortion or shortening. Or the axis of the joint above or below the fracture may be so altered as to leave a disability which increases with time. If the mal-position is left undisturbed until the final process of repair is reached, that is, until the sclerotic process is complete, little can be looked for from a reconstructive operation, and corrective or orthopædic measures may be preferable. The best time for reconstructive methods is before the fractured ends become sclerotic. Once it has been decided to correct the mal-position by open methods and refracturing, the treatment then resolves itself into the same surgical problem as in the treatment of non-union, the most important feature of which is the securing of bony union of two more or less sclerotic bone ends in good anatomical alignment, in the hope that good function will result therefrom. To accomplish this, the operation of bone grafting has the most to recommend it, using where possible, an autogenous graft. Metal plates, screws, nails or wire do not promote the formation of new bone, and although they may firmly hold the sclerotic ends in apposition for a time, absorption soon takes place, the ends become loose and valuable time is lost.

Much has been learned in recent years regarding the repair of bone lesions, and it is now generally accepted that all portions of bone enter into the process of regeneration and repair. In a massive graft, osteogenesis goes on from all free surfaces. Endosteum, periosteum and all cut surfaces of the osteum proliferate to form new bone, although the cells of the deep portion of the graft may be absorbed. It is generally accepted, too, that the periosteum with the layer of bone next it, has the greatest osteogenetic power. In view of the light of this knowledge, it would seem reasonable to claim that the operation of choice would be the use of the heavy massive trench graft, held firmly in position, and supplemented by an osteoperiosteal graft if you wish. This should be the most likely to secure union, and the fractured ends will be firmly splinted while the process of repair is going on. (Figs. 4 and 5). No matter what operation is elected to be performed, the objects should be the same, that is, the securing of union in good anatomical alignment as simply as possible. Whether one chooses the sliding bone graft and intramedullary peg, a cortical bone graft or inlay, or an osteo-periosteal graft, is a question to be decided by the condition met with at operation. Surgery will never be so standardized that any one set operation can be applied to all cases. One's conception of the bone lesion before operation may lead him to believe that an extensive bone graft operation is the method of choice. At operation he may so alter his opinion that a simple operation such as bone

FIG. 4 FIG. 5

FIG. 4.—Long grafts of gap fractures are often fractured, especially in the radius.

FIG. 5.—Transplanting ulna to radius may give a forearm with good carrying power, but without ability to pronate or supinate.

pegging, or insertion of a kangaroo tendon suture may be decided upon. The treatment of a fracture with fibrous union and fragments in good alignment is a vastly different problem from the treatment of a gap fracture, yet our objective is the same. The type of bone graft to be used must depend on the individuality of the case in question. No attempt is being made in this paper to consider individual cases. Our attention will be given to an outline of the principles of treatment more or less applicable in all cases. The following principles are fundamental: (1) the bone fragments must be immobilized; (2) the graft must be long enough to extend well beyond the sclerosed portion of bone, and into healthy bone tissue at each end; (3) no attempt should be made to bone graft in the presence of sepsis. The various motor saws now on the market enable the surgeon to cut the massive

bone graft and fit it into its new home with mechanical perfection. This will aid in securing fixation of the massive graft in such a manner that it is little likely to wiggle loose if fitted with precision. Bone repair is also more likely to take place if the graft is held firmly in place with like tissue in contact with like tissue.

TREATMENT OF GAP FRACTURES

Gap fractures present so many features different from ordinary cases of non-union, in which apposition of fragments is present, that they constitute a distinct surgical problem. In these cases there may be wide separation of fragments, the result of injury, infection or operation, and in the forearm or leg apposition of the fragments of one broken bone may be prevented by a rigid parallel bone which holds the fractured ends apart. Medical literature of recent years has been flooded with articles exalting the virtues of bridging such gaps by an auto-transplant of bone. Every new method introduced to our profession usually goes through a period when the hyper-enthusiast spreads its field of usefulness beyond the realm of practicability. These bone grafts may live and in time result in most brilliant successes, but their use is not applicable to all cases. In our industrial population, where most of these cases will occur, the time for a new humerus or a new femur to regenerate sufficiently to be of any practical use would be so long as to exclude this type of operation from the field of practical usefulness altogether, or, at least, make it second in choice to shortening the limb by resecting the sclerotic ends of bone and securing union by performing a "step" operation or using some form of bone graft, and maintaining the position of the fragments by various methods of splinting, including plating. The humerus is notorious for its lack of regenerative powers, and non-union is more common in this bone than any other bone of the body. Bone-grafting a gap fracture of the humerus will often end in failure, and shortening the limb may be preferable in gap fractures of both humerus and femur.

In treating gap fractures of the tibia we may either resort to the use of a bone graft or shortening the leg by division of the fibula.

In gap fractures of either the radius or ulna, the gap may be bridged by an auto-transplant of bone, the unfractured bone may be sectioned, and the limb shortened to bring the fractured ends in apposition, or the two bones may be combined, using the upper portion of the ulna and the lower portion of the radius to form a new bone, thus giving the patient a forearm with one bone, but a very useful forearm. Any one of these operations may be successful. In the ulna, gap fractures are quite successfully treated by the use of an autotransplant of bone, as the stress and strain on the graft can be reduced to a minimum. Fracture of the graft is not infrequent in the radius, as the mere act of pronation and supination is sufficient to fracture the graft during the period when absorption is going on and new osteoblasts are being laid down. It may be elected to perform shortening if the gap is not too great, but where the gap is a large one the combination or union of the radius and ulna is preferable.

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3. *Arch. Surg.*, 1923, **6**: 172.
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DISSOCIATION OF THE BCG STRAIN.—R. S. Begbie reported last year that he had been able, by plating on Petroff's medium, to obtain three different colonial variants of the BCG strain: (1) a smooth variety, with a central dome and spreading margin; (2) a rough variety, composed of heaped-up coils, and relatively compact; and (3) an intermediate variety with an umbilicated centre and a slightly crenated margin. The rough variety was similar to that described by Petroff; the smooth variety differed from Petroff's smooth type; and the intermediate variety had not been described by Petroff. In a later paper (*Edin. M. J.*, March, 1931, p. 173) the author now describes virulence experiments carried out on guinea-pigs with the three variants, as well as with two different strains of the undissociated culture. Intracardiac and subcutaneous inoculations were employed, the dose in each series being equivalent to 2 mg. of the dried organisms. Many of the animals injected intracardially died, with multiple tubercles in the viscera; since the dose was large, and as no control animals injected with killed organisms were used, it is difficult to interpret the results. None of the animals injected subcutaneously died, and when killed 69 to 102 days later some of them showed, besides a local lesion, small tubercles in the internal organs. No clear-cut distinction was established between the virulence of the different variants or whole cultures examined.

INTRAVENOUS PYELOGRAPHY WITH SKIODAN

A BRIEF CLINICAL REPORT

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THE introduction of uroselectan for intravenous pyelography by Swick and Von Lichtenberg has proved to be an invaluable aid in the diagnosis of genitourinary diseases. The drug is a popular one and is being used very extensively all over the world. Up till recently uroselectan has been employed in a large number of cases in our Clinic. A report by Dr. N. E. Berry from our department has just been published.[1] Since April, 1921, we have been using a new medium for excretion pyelography, and with very satisfactory results. The drug is known as "Abrodil" in Germany, and "Skiodan" on this continent.

The drug was introduced by Bronner, Hecht and Schueller in August, 1930. They performed extensive preliminary pharmacological tests and reported their experimental findings. It was only later that they introduced the drug clinically, and their results were published in February, 1931.

Physical and chemical properties.—Skiodan, or abrodil, is the sodium salt of mono-iodomethane-sulphonic acid, and the chemical formula is $ICH_2 SO_3 Na$. It contains 52 per cent of iodine which is very firmly combined, and, therefore, not found in a free state in the urine. It is a white powder and is readily soluble in water giving a colourless solution. The latter is neutral in reaction, and when sterilized may be kept for a long period of time without decomposing.

Dose.—In determining the dose for clinical use laboratory animals such as mice, rabbits, cats and dogs were first used by the original workers. They found that these animals tolerated relatively large doses. In the case of mice, for example, 7.5 grams of skiodan per kilogram in a 15 per cent solution did not produce any untoward results. The striking fact was that even after the injection of the largest doses the urines of the laboratory animals were always free from inorganic iodine. This proved that the drug was excreted by the kidneys without splitting off free iodine.

The average dose for the human adult is 20 grams. We have used amounts as little as 10 grams, and as high as 30 grams, and have come to the conclusion that the best results have been obtained with doses of 25 grams, given in a 25 per cent solution. The drug is now put up in 20 gram bottles.

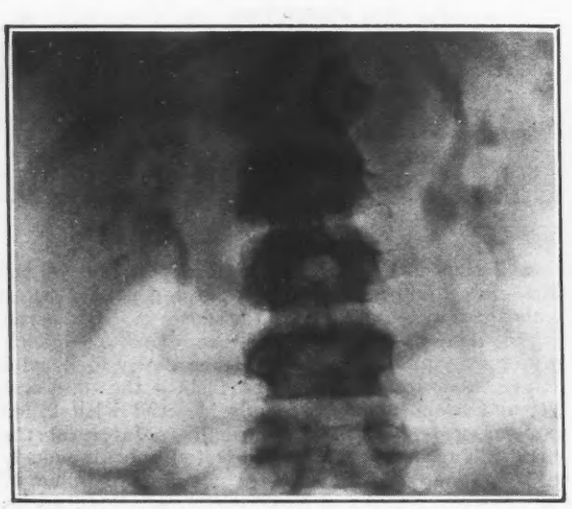

FIG. 1.—Taken 15 minutes after injection of skiodan in a case of exstrophy of the bladder. Note the relatively normal renal pelves and calyces.

FIG. 2.—Taken 35 minutes after the injection of skiodan in the same case as Fig. 1, after transplantation of the right ureter into the large bowel. Note the bilateral hydronephrosis and hydroureter.

Rate of excretion.—The drug is a very efficient diuretic and the rate of excretion is high. It has been estimated that 47 per cent of the total amount of the drug is excreted during the first hour and 76 per cent after three hours. In spite of this rapid excretion a heavy load is not imposed on the kidneys. The urine remains normal and the kidneys of laboratory animals do not show any pathological lesions other than at times a mild cloudy swelling.

Method of administration.—Little preliminary preparation of the patient is necessary. A good cathartic is given the night before, followed by an enema in the morning. The patient does not have to be hospitalized. The precedure is a simple one, and may be done in the physician's office. Twenty or twenty-five grams of the drug are dissolved in 100 c.c. centimetres of double distilled water. The solution is then filtered twice and is sterilized in an autoclave for 20 minutes at 15 pounds pressure. The solution is then cooled to body temperature and is injected into the median cephalic or basilic vein. In clinics where this procedure is practised frequently a stock solution may be made and kept for a long time

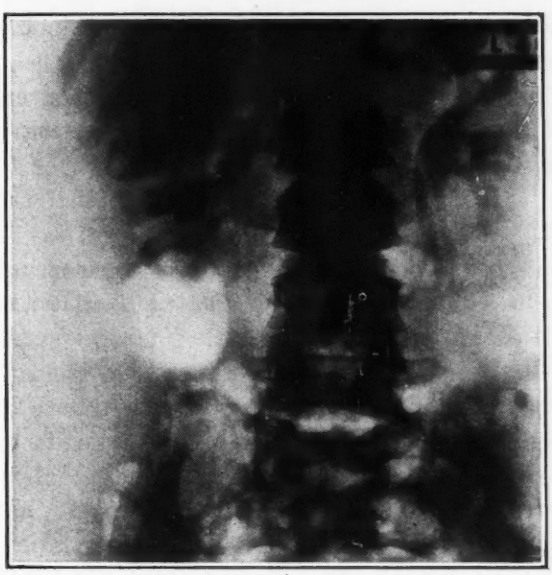

Fig. 3.—Taken 65 minutes ofter injection of skiodan in the same case as Figs. 1 and 2, after transplantation of both ureters. Note the destroyed right kidney, and the large hydronephrosis and hydroureter on the left side.

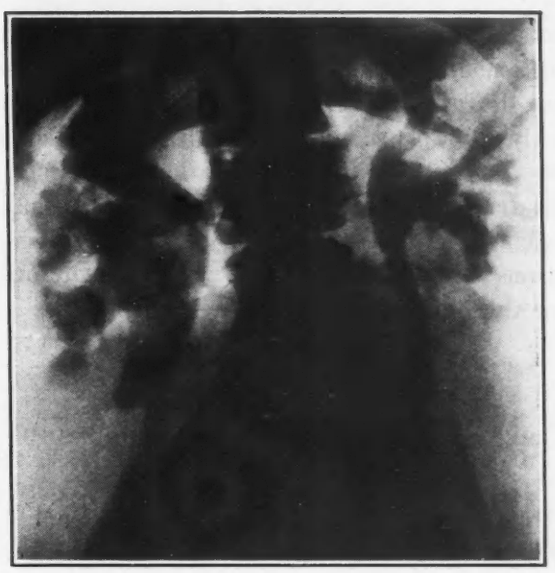

Fig. 4.—Taken 90 minutes after injection of skiodan in the case of a woman eight months pregnant. Note the bilateral hydronephrosis and hydroureter, more marked on the right side. Note also the kinks in both ureters.

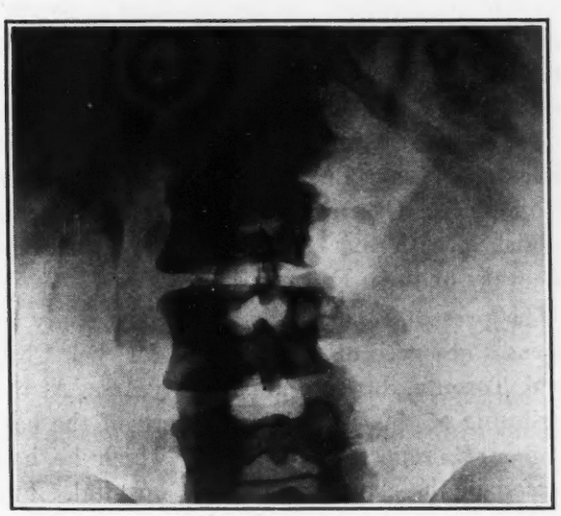

Fig. 5.—Taken 40 minutes after injection of skiodan in a case of carcinoma of the left kidney. Note the relatively normal right renal pelvis and calyces, and the complete absence of a pyelogram on the left side.

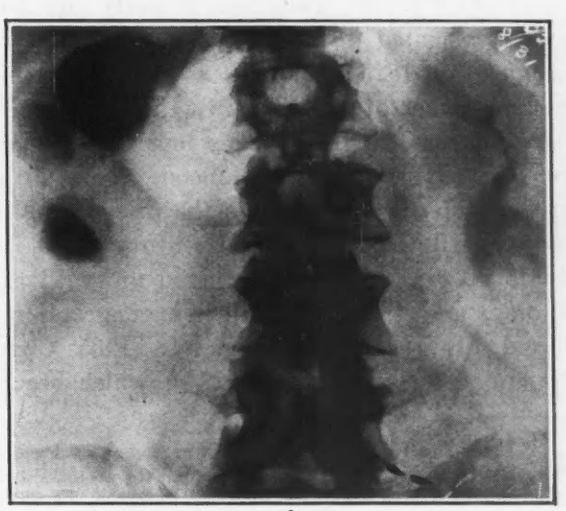

Fig. 6.—Taken 55 minutes after injection of skiodan in the case of a large right renal calculus. Note the large destroyed right kidney with the calculus. There is also a mild left hydronephrosis.

without decomposing. In our experience we have not had any general reactions whatsoever, and, provided that all the solution went into the vein, there were no local reactions such as pain up the arm. The drug has been given to pregnant women without causing any accidents. Repeated examination of their urine before and after injection did not reveal any changes. The drug is safe and well borne and its use is contraindicated only in cases with the severest form of renal insufficiency.

Roentgenograms.—Since the drug is a strong diuretic and is excreted very rapidly in the first hour it is obvious that x-ray plates must be taken during this first hour. It is true that later the amount of iodine excreted may still be high, but diuresis is less. It has been found that as early as two to five minutes after the injection an x-ray plate will reveal marked excretion of the drug. In our clinic the first picture is usually taken ten minutes after the injection. Roentgenograms are then taken every fifteen minutes for the next hour. From then on pictures are taken depending on the rate of excretion of the drug. Occasionally, as in large hydronephroses and hydroureters, the pelves and ureters may still be visible four or five hours after the injection of the drug. In such cases we continue to take plates until all the drug has practically disappeared.

CONCLUSIONS

1. Skiodan is a very safe and non-irritating drug for excretion pyelography.
2. The drug is given in doses of 20 to 25 grams in a 20 to 25 per cent solution.
3. Severe impairment of kidney function is the only contraindication to the use of skiodan.
4. Skiodan is a very excellent diuretic.
5. One should start taking roentgenograms as early as ten minutes after the injection of the drug.

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BRONCHIECTASIS IN CHILDREN*

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BRONCHIECTASIS has been regarded as a rare disease in childhood, despite the fact that from its earliest recognition as a disease entity its frequent inception in early life has been commented upon by those who studied it. Laennec in 1825, reported a series of cases studied by one of his assistants, Cajol, some ten years earlier. In three of his four cases symptoms dated from early childhood. Very little further reference is made to the disease in the young until the close of the century when its childhood origin is again referred to by Clark, Hadley, and Chaplin in their monograph on fibroid disease of the lung. In 1905 Clive Riviere[1] described 33 cases, 23 of which began before 5 years of age. This author gave a classification of the main types of the disease, and also described its pathology and possible mode of production. Since this time numerous articles dealing particularly with the pathology and etiology of the disease have appeared, but until 1922, when Siccard and Forrestier[2] introduced the use of lipiodol for the depiction of the disease, few have dealt with its clinical course or diagnosis. Case reports and papers are being published with increasing frequency since the discovery of these Frenchmen.

The present report is based on the study of 56 cases observed at the Hospital for Sick Children, Toronto, during the past 10 years. At the beginning of this period Dr. Elliott, of the hospital staff, reported some cases which he had treated in the chest clinic of the hospital. For the most part, however, the disease passed unrecognized, variously diagnosed as chronic or recurring bronchopneumonia, chronic bronchitis,

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Read before the annual meeting of the Canadian Society for the Study of Diseases of Children, Brockville, Ont., June 21, 1930.

lung abscess or frequently tuberculosis. The more frequent and accurate diagnosis, made possible largely by the aid of the bronchoscope, has led to a striking, but apparent, rather than real, increase in the incidence of this disease in our wards.

ETIOLOGY

There is little evidence of any predilection for one or other sex in our cases; 27 were males and 29 females, with 3 not specified. The age of onset varies from as early as 2 months to as late as 10 years. Most cases, however, started before the age of 2. In two, the parents were unable to recall any time in the child's life in which cough was absent. Thorpe[3] mentions a congenital form of the disease with resultant cyst-formation.

The variety of pulmonary conditions with which bronchiectasis is associated makes it difficult to determine the causative factor. The consensus, however, assumes the bronchial dilatation to be secondary to some infection or injury of sufficient severity to disorganize the integrity of the bronchial wall. The persistence or severity of the infection and subsequent infections then increase the ectasis by the fibrosis produced in healing, or produce further destruction. Kaufman suggests the presence of a congenital weakness of the walls which permits the ectasis to occur. Whether this be true or no is difficult to prove, but cases are rare in which previous disease, of the type known to affect the integrity of the bronchial wall, has not occurred. The following are the factors which led to the production of the disease in our cases:—

TABLE I

	Cases
Bronchopneumonia	23
Recurring or chronic bronchitis	7
Measles and pertussis together	5
Pertussis alone	5
Measles	4
Influenza	4
Empyema	4
Tonsillectomy	2
Lung abscess	2
Cough—always	2

Bronchopneumonia, usually in repeated attacks, would appear, therefore, to be responsible for the largest number of cases. Probably its responsibility would appear even greater if it were possible to know the degree to which it was present in some of the other cases. The etiology of those cases attributed to lung abscess is uncertain. It is even debatable whether the abscess was the cause or secondary to the bronchiectasis. We are inclined to the former view.

BACTERIOLOGY

No specific bacteria have been found. In the majority the infection was not only mixed, but the flora varied from time to time in the same patient. Cultures of turbid or even purulent fluid aspirated from the paranasal sinuses were at times disappointingly sterile. The results of the cultures from some of our cases are shown in Table II. It will be seen that hæmolytic streptococci occurred alone or in combination more frequently than any other organism. The

TABLE II

BACTERIOLOGY OF BRONCHIECTASIS

Organism	*Where obtained*		
	Sputum	*Paranasal sinuses*	*Lung, by aspiration or suction*
Hæmolytic streptococcus	6	–	6
S. viridans	6	1	1
Pneumococcus	3	2	4
B. influenzæ	0	2	4
Spirochætes and Fusiform bacilli	3	–	3
Staph. aureus	2	0	0
Unidentified	1 Gram + cocci	0	2 1, Gram – diplococcus 2, Gram + coccus
Sterile	–	3	0

small number of positive cultures of *B. influenzæ* is no doubt due to the chronic nature of the case when the culture was obtained. *S. viridans* was more frequently associated with fusiform bacilli and spirochætes than was any other organism. Fusiform bacilli alone or with spirochætes were found only in abscess cases, but in none of the latter was the abscess the etiological factor in producing the bronchiectasis; in only one was the sputum fetid, and the presence was not constant even in the same case from time to time.

The relationship between tuberculosis and bronchiectasis has been the subject of some dispute. McPhedran[4] regards tuberculosis as a frequent cause. McNeil[5] comments on the infrequency of the association of the diseases, which he attributes to the obstruction to the spread of the tuberculous infection because of the walling off of the lymphatics by the extensive fibrosis present in bronchiectasis. In our cases the effort made to prove the case tuber-

culous was often excessive. The results obtained from the intracutaneous tuberculin test in 50 cases were 9 positives and 41 negatives. In most instances, repeated negatives were obtained before the result was accepted. With one exception, no anatomical tuberculous lesion was found among the positive reactors, and it was not felt that the tuberculous infection was of any significance in relation to the bronchiectasis. In the one exception, the tuberculous lesion was extensive and the bronchiectasis only discovered post-mortem. On the other hand, although our pathological museum boasts but few specimens of bronchiectasis, there are two in which tuberculous glands have caused the development of a retention bronchiectasis.

PATHOGENESIS

Opinions differ as to the mode of production of bronchiectasis but all agree on its secondary nature. The primary disease may involve the lungs, bronchi, pleura, or even the hilus and mediastinal glands as in the tuberculous cases. The main difference of opinion is as to whether the extensive fibrosis always found is the cause or the result of the disease. One of the earliest monographs on the subject by Corrigan, of Dublin, dealt with the dilatation of the bronchi produced by the traction of the fibroid disease of the lung. Many observers since that time have concurred in his views. It would appear more logical to regard the fibrosis as secondary to the primary disease of the bronchi produced by the healing process, and probably of little importance in the acute cases, but playing an increasingly important rôle as the case becomes more chronic.

Two factors appear to be essential to the production of bronchial dilatation: (1) obstruction of a bronchus, particularly if this be partial; and (2) infection. If the former is present without the latter the tendency is towards the production of emphysema rather than ectasis. The nature of the obstruction varies. It may be within the bronchus, such as swelling of the mucosa, viscid secretion or a foreign body, or without, as in the case of enlarged hilus or mediastinal glands in tuberculosis. At first sight it would appear difficult to explain the production of this disease following empyema in this way. Pleural fibrosis might conceivably be a primary cause in such cases. However, if the facts pointed out by McNeil and his co-workers be recalled, such an explanation of the onset is quite unnecessary. These authors state that lung suppuration occurs in fully one-third of the cases of empyema, and only in 12 per cent of the pneumonias uncomplicated by pleural pus, and, further, that bronchopneumonia is more frequently associated with suppuration in the pleural cavity. Thus one cannot be certain whether the bronchial ectasis was produced coincidently with the purulent pleurisy or in consequence of it.

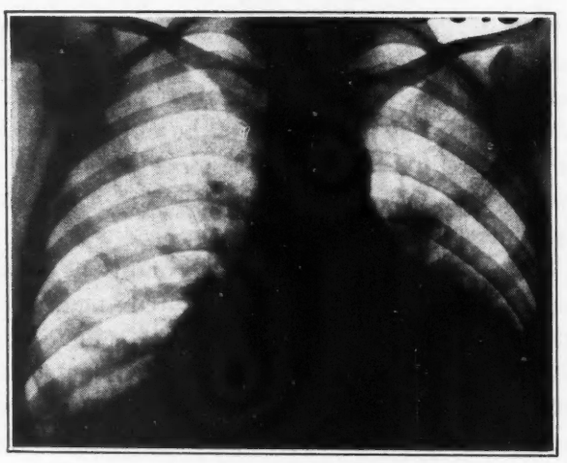


FIG. 1.—(H.J.), aged 7, with symptoms of four years' duration. Note the displaced, rather narrow mediastinum, sharp borders of upper part of heart, obliteration of cardiohepatic angle and suggestive honeycombing of right base.

The site of the lesion possibly bears some relation to its pathogenesis. Twenty-seven of our series had demonstrable cavities. These latter were located as follows: 15 were left-sided; 6 were right-sided; 6 were bilateral. Seventy per cent of unilateral cases are on the left side. Of the 6 right chest cases, tonsillectomy initiated symptoms in 2 and a foreign body in 1, whereas in those on the left side, responsibility was placed on tonsillectomy only once. Further, 51 per cent of the total series which developed abscesses were left-sided, and only 27 per cent right-sided, a fact which might be accounted for by better drainage through the more direct right bronchus, or possibly the difference in the etiology of the disease on the two sides.

PATHOLOGY

In the gross, probably the most striking feature is the degree and density of the pleural

adhesions. This is seen even in infants. The indurated feeling of the lung indicates its involvement in the fibrotic process.

The ease with which bronchial dilatation is produced in the lungs of children suffering from bronchopneumonia, particularly when the latter is caused by measles, pertussis and influenza, is well demonstrated by Loeschke[7] in his recent work. The progressive pathological picture from this stage to well developed bronchiectasis is well described by McNiel and his co-workers. First there occurs the disintegration of the bronchial wall, often going on to complete destruction, until its previous existence is apparent only as a space surrounded by consolidated alveoli. There ensues a reparative stage in which granulation tissue is succeeded by fibrous tissue, often lined with epithelium

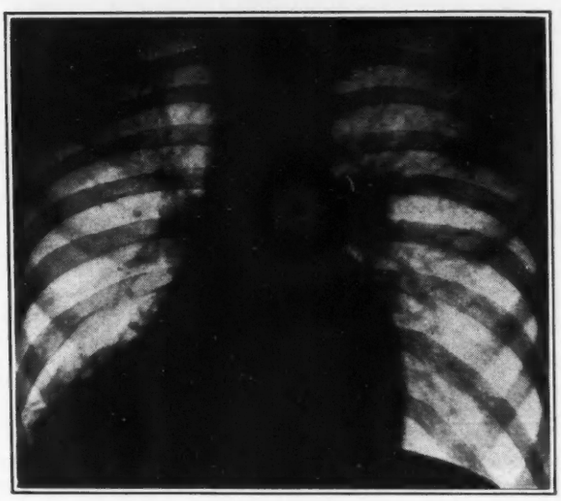


FIG. 2.—(H.R.), aged 11, six years after onset of the disease. Note the same features as in Plate 1, but the more marked cardiac displacement. Lipiodol injection demonstrated a large bronchiectatic abscess in the posterior part of the right lower lobe.

from a contiguous bronchus. Early fibrosis of the lung between these ectatic bronchi may be observed at this time. The shape of the ectatic bronchus depends on the degree of cavitation present and whether the whole wall is involved or not. These authors believe that bronchiectasis follows an acute infection severe enough to disorganize the bronchial wall, and that fibrosis is a necessary accompaniment of such a change.

Our pathological material has been limited to 4 cases, all infants under 2 years of age with histories of chronic pulmonary infections. In 3 an acute bronchiolitis with fairly well marked fibrosis was present. The fourth child, aged 6 months, had had symptoms and signs suggesting bronchiectasis for nearly 4 months. At autopsy definite bronchial dilatation with associated abscesses was found. Cultures of the pus were made and *S. viridans and B. influenzæ* were obtained. In all these children degenerative changes were found in the kidney tubules, but no definite evidence of amyloidosis was present. In only 2 of the 4 had kidney involvement shown itself by the presence of albuminuria during life. These cases demonstrate how rapidly the pathological changes of bronchiectasis may be produced, and show how unlikely complete restoration of function would be. There are two further cases from which specimens have been obtained. Both were tuberculous patients in whom the bronchial dilatation was unsuspected during life. They are not included in the pathological picture described above because the tuberculous changes masked any others.

SYMPTOMS AND SIGNS

From its first recognition as a disease entity it has been regarded as almost typical of bronchiectasis that it was of long duration unassociated with any marked deterioration in the general health. Laennec pointed this out and such recent observers as Findlay and Graham[9] are inclined to the same view. These observers state that the bronchiectatic children they studied were only a little below weight for their age. In our series the general health was usually seriously affected. The children were considerably underweight, pale, and tired easily. They were seldom able to attend school regularly. In addition, many of them suffered from acute exacerbations of their disease or recurring respiratory infections which kept them in bed for days at a time. The health usually improved and symptoms abated during the warm weather, only to recur again with the onset of winter. Those who developed abscesses from which profuse foul sputum was coughed up not only suffered chronic ill health but were an offence both to themselves and those who cared for them.

Cough is the one symptom almost always present. It varies in its type and in its severity. Some patients are never free, while others have it periodically. In these latter it is frequently associated with an increase in the chest

signs, and they are regarded and treated as chronic bronchitis. Change of position often produces a spell of coughing and for this reason the patient often complains of cough on rising or retiring.

Sputum is usually present, but varies from scant, tenacious, odourless globules, expelled with great difficulty in some, to a pint or more daily of extremely foul smelling pus in others. In younger children the sputum is often swallowed and no complaint made of its presence. In some any attempt to induce anæsthesia causes the expulsion of a large amount of pus unexpectedly. Occasionally, it settles out into the three layers typical of gangrenous processes in the lung.

Hæmoptysis is perhaps seen oftener in bron-

FIG. 3.—Lipiodol picture of early bronchiectasis. (G.P.), aged 7, with a history of repeated attacks of bronchopneumonia since infancy. Note the normal right side and early saccular dilatation of the bronchi on the left side.

chiectasis than in any other pulmonary disease of childhood. It varies in degree from a tinging of the sputum to several ounces. In the latter cases it usually recurs from time to time. It was sufficiently severe to be the cause of death in one of Findlay and Graham's cases. Hæmoptysis may occur at any time during the course of the illness, and, though not often, this initial sign may be the first one of sufficient severity to draw attention to the presence of pulmonary disease.

Dyspnœa is entirely lacking in most cases, but is so severe as to cause almost constant respiratory embarrassment in others. The amount of emphysema present seemed to determine its severity. In emphysematous cases the chest is barrel-shaped and fixed in the respiratory position. The children thus affected, of whom there were 4 in our series, have typical asthmatic attacks, but their protein sensitization tests are negative. The dyspnœa in others amounts to no more than the shortness of breath that any run-down child may feel on exertion. In others, respiratory difficulty is only present during acute exacerbations of the disease.

There is no characteristic temperature curve. *Fever* may be entirely lacking throughout the course of the disease, even when cavities are present. Those who suffer from periodic exacerbations or bronchopneumonia usually have the temperature common to this disease during attacks.

Night sweats, frequently severe, are often complained of, and excessive perspiration after

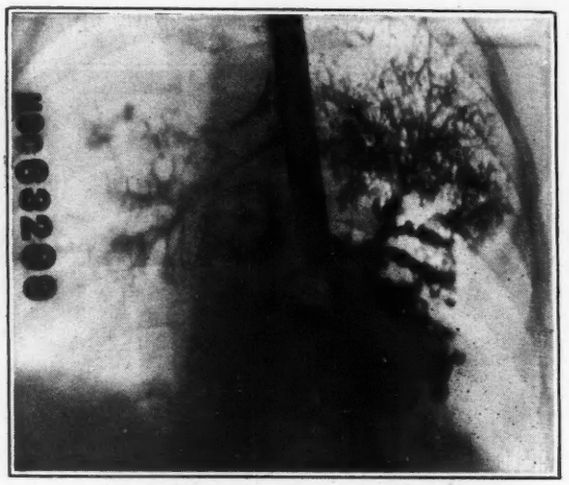


FIG. 4.—Lipiodol picture of extensive unilateral disease. Child, aged 6, with recurrent bronchial infections for two years. Note the "bunch-of-grapes" appearance of the lower bronchi and the normal upper ones.

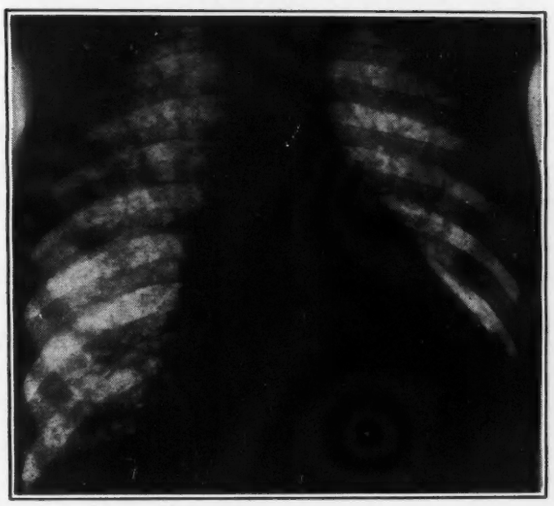
effort is frequently noted. The night sweats are evidently not due to fluctuations in temperature, as in the tuberculous, but to the general debility of the child.

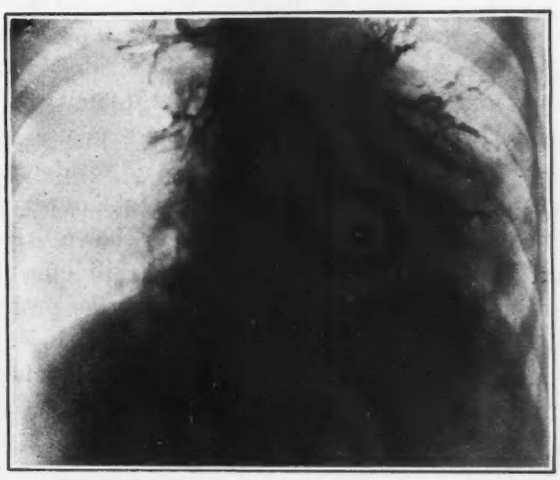
PHYSICAL SIGNS

There are no unequivocal chest signs in bronchiectasis. They may be entirely lacking, except during a "flare-up", or so marked that the stethoscope can detect very little normal lung tissue. One abscess case may have amphoric breathing and consonating râles over the affected area, and the next case of apparently similar nature show little but some suppression of breath sounds with an occasional râle or rhonchus. The physical findings in others are those of consolidation of one or more lobes, and a diagnosis of chronic broncho-

pneumonia or unresolved pneumonia is appended. As mentioned above, the emphysema present may be severe enough to give the typical barrel-shaped chest.

Shifting of the mediastinum to the affected side is frequently observed. Lord[10] says such displacement occurs in cases with occluded bronchi. In 7 of our cases cardiac displacement was noted, always to the affected side. In 3 of these, massive enlargement of the hilus glands was noted in the skiagram, and in a fourth, glands pressing on the bronchus were noted at autopsy. In all cases the amount of fibrosis present was marked.





FIGS. 5 AND 6.—(A.W.), aged 6, with extensive bilateral disease dating from early infancy. Note in the flat plate the "squashed down", sharp edged heart, narrow mediastinum, and the honeycombing in the right lower lobe. The lipiodol picture shows the large bronchiectatic abscesses on the left side. A similar picture of the right side was obtained when lipiodol was injected into the right descending bronchus.

Clubbing of the fingers and toes was present in 14 cases, all of which had cavities and large amounts of sputum, sometimes foul. The cases were usually of long standing, but one was in an infant who died at 17 months. All abscess cases did not show clubbing, nor did all those with abundant fetid sputum. It is interesting to note that well marked clubbing may completely disappear after prolonged adequate drainage of the abscess cavity.

Evidences of *amyloidosis* have been wanting. *Albuminuria,* sometimes intense, is occasionally present, and degenerative changes in the renal tubules were seen in all the fatal cases.

The discussion of physical findings would be incomplete if no mention were made of the constant presence of infection about the nose and throat which play a large part in maintaining the infection. Diseased tonsils and adenoids are so common and obvious that they usually receive attention. The less obvious, but equally serious, infections in the paranasal sinuses are so common as to be regarded as constant by some authors. Thorpe[11] recently reported a series of 53 cases in children, 38 of which had demonstrable evidence of infection in this area. In our earlier cases such infections were unsought and unfound. Since thorough examinations of this area have been made, evidence of involvement has been found in the majority.

DIAGNOSIS

X-ray examination.—The uncertainty of any pathognomonic picture being shown by x-ray, either in the flat plate or even stereoscopic ones, is well known. No one will dispute the superior merits of pictures taken after the diseased area has been filled with some opaque substance, but at times such pictures are difficult to obtain. It is well, therefore, to know the more common findings in the ordinary x-ray picture, remembering that their absence does not exclude bronchiectasis. In well established cases the x-ray picture is often definite. The "honeycombing", seen particularly in the lower lobes, is pathognomonic. Fortunately, all cases have not reached this stage when first seen, and in these, although the flat plate gives no typical picture, it shows suggestive evidences such as extensive fibrosis, cardiac displacement, blurring of the cardio-hepatic angle, enlargement of the

hilus glands, with no other evidence suggestive of tuberculosis.

Some few years ago the idea of injecting some substance opaque to the x-ray into the bronchi, in order that a clearer picture of their condition could be obtained, was conceived. Chevalier Jackson[12] attempted to outline the bronchi by insufflation of bismuth and barium powders. Shortly after, Lynal[13] employed a mixture of bismuth in oil. No widespread use of such measures was made until after 1922, at which time Siccard and Forestier demonstrated the value and relative freedom from toxicity of lipiodol. Pritchard *et al.*[14] reported its use in a series of 100 cases in adults with no accidents, no aspiration pneumonia in any, a slight pyrexia or iodism being the only ill effects shown. In our small series of children serious ill effects were observed only once, early in its use, probably due to a too early repetition of the injection. Iodism has never been seen, possibly because little has escaped into the stomach, a factor which is apparently important in its prevention.

Several methods and routes for the injection of lipiodol are in common use, injection into the trachea, aspiration of the oil injected into the larynx, and through the bronchoscope. We have used the last method and find it the most satisfactory, not only for the introduction of the lipiodol but for the further information obtained by it. Not infrequently the most seriously diseased bronchus has been found so swollen or so full of secretion that the way had to be cleared before lipiodol could be successfully injected. This plugging of the lumen was found sufficiently often that one can hardly conceive how the oil could gain access to the diseased area by any other method. General anæsthesia has been used in most cases. During the first year it was in use such a procedure was often followed by a reaction, principally in the nature of laryngeal œdema. With the development of better technique ill effects are extremely uncommon and the children seem very little disturbed by the procedure. In fact it is often followed by distinct improvement.

Signs and symptoms.—There are no symptoms pathognomonic of bronchiectasis, at least until it is well established, and sometimes not even then. It is our belief that such a diagnosis should be considered: (1) when cough, particularly with sputum, persists more than a few months after such illnesses as pertussis, measles, influenza or bronchopneumonia; (2) in so-called chronic bronchitis, especially if clearing up of infectious foci in the upper respiratory tract does not produce improvement or cure; (3) in those having repeated attacks of bronchopneumonia, if these continue after eradication of infective foci. The diagnosis is more likely if hæmoptysis in some degree and night sweats are associated with the cough.

The diagnosis can only rarely be made on physical signs, but persistent consolidation, moisture or signs of cavitation, particularly in the lower lobe are very suggestive. An x-ray picture, preferably stereoscopic, should be taken, and, as pointed out before, may establish the diagnosis. Whenever at all possible a bronchoscopic examination with the injection of lipiodol should be made, as it not only establishes the diagnosis with certainty but gives valuable aid as to prognosis and the correct line of treatment.

Bronchiectasis must be differentiated from chronic bronchitis, lung abscess due to the aspiration of a foreign body, and tuberculosis. From the last mentioned, the generally better health in relation to the extent of the disease, and the absence of tubercle bacilli in the sputum, are the most important points in differentiation. It is often impossible to make a certain diagnosis from bronchitis without the aid of lipiodol. In some, however, the better response to the eradication of infectious foci, and the absence of signs of consolidation or cavitation in bronchitis, and their possible presence in the more severe disease make a clinical diagnosis possible. The history is the most important point in determining the presence of lung abscess due to a foreign body, but when there is any doubt, bronchoscopic examination is doubly useful.

PROGNOSIS

The prognosis varies, according to different observers, all the way from good to so bad that that patient eventually would desire death rather than the miserable existence imposed by the disease. It is somewhat disconcerting, when considering the effect of treatment, to read of this possible benign course. Laennec referred to it as almost a cardinal feature of

the disease, and some modern observers apparently share this opinion (*e.g.*, Thursfield and Paterson[15], Nobécourt[16]). The latter explains the frequency of recovery in children by the cessation of the bronchial ectasis after a time and the continued growth of the child leading to the resumption of the normal proportions between bronchi and lung. Two of our cases, once of severe nature, have seemingly reached an arrested stage, and are at present free from symptoms referable to the disease. The tendency, however, is generally progression in the extent of the lesion and its effect on the health of the child. How treatment can alter this course we cannot say at present. Too short a time has elapsed since any consistent effort was directed toward this end.

Death does not occur very often from the disease itself, except in the acute forms seen inn infants. Fatal hæmoptysis has been reported. Bronchopneumonia was the cause of death in 4 of 7 fatal cases, miliary tuberculosis in 2, nephrosis in the other.

TREATMENT

Before the last two years our treatment, like that in most places, was directed toward improvement of the general health, rather than to any direct attack on the disease itself. Fresh air, sunshine and rest were used. Tonsillectomies were done, and, when cure did not follow, one or more courses of vaccine were given, sometimes with temporary benefit. A big step forward was taken when attention was directed to paranasal sinusitis as an etiological factor. No one who has seen these cases will doubt its almost constant presence and deleterious effect. Otitis media in infants often plays the same rôle. In early cases the proper eradication of focal infections, possibly combined with the use of an autogenous vaccine will produce a cure. The more general application of such therapy in potential cases of bronchiectasis would prevent its development in many.

It might be well to outline in brief the treatment directed against the diseased lung itself. The thorough searching out of infective foci and their eradication is indicated in all cases, and measures directed against the disease process are helped or hindered in direct proportion to the thoroughness with which this treatment is carried out. Reports of progress, rather than results of treatment, are all that can be given as yet. It is felt that surgery will come to play an important rôle in the therapy of this disease, but at the present time we do not feel justified in subjecting patients to such radical treatment as lobectomy or thoracoplasty until less heroic measures have been given a chance. The following tentative plan has been adopted at the Hospital for Sick Children:—

1. Bronchoscopic examination with the injection of lipiodol, then; in (a) *unilateral cases*—pneumothorax; repeated bronchoscopic suction; postural drainage; in (b) *bilateral cases*—repeated aspiration; postural drainage; lipiodol.

We feel that bronchoscopic examination and lipiodol injection should be the initial step in the local treatment of all cases. Therapeutic as well as diagnostic value is attached to this procedure. Lipiodol is supposed to have an antiseptic effect. Some observers, (Newswanger,[17] Archibald and Brown[18]) however, have shown that such an effect is very slight on most of the organisms commonly found. We have used it in only a few cases in which it was not combined with suction, so the beneficial effect may quite readily have been due to the latter.

The treatment of extensive unilateral cases offers several methods from which to choose. We have placed them in what we consider their order of merit. Pneumothorax is, of course, contraindicated when extensive fibrosis, particularly pleural, is present. These adhesions make collapse impossible without the employment of surgical means to remove them. Pleural reactions, characterized by pain and the development of a friction rub, make discontinuance of this treatment imperative. It would seem the method of choice, when available, because results so far are encouraging and it demands less hospitalization than other therapy. A good collapse is secured while the child is in hospital and refills done in the outdoor at bi-weekly or tri-weekly intervals. The same problem arises as when this treatment is used in tuberculosis, namely, when should it be discontinued?

2. Repeated bronchoscopic suction, with or without the injection of lipiodol, seems best indicated in abscess cases, either unilateral, in which pneumothorax is impossible, or bilateral.

It is contraindicated when hæmoptysis is a prominent feature. There is usually more symptomatic improvement than alteration in the physical signs. The freedom from symptoms lasts anywhere from three to five months, when the operation must be repeated.

3. Postural drainage is, of course, no new procedure. We feel, however, that it has never been given a really fair trial. The desired posture has not been maintained either well enough or long enough. Recently, with the help of the surgical service, the frame illustrated has been

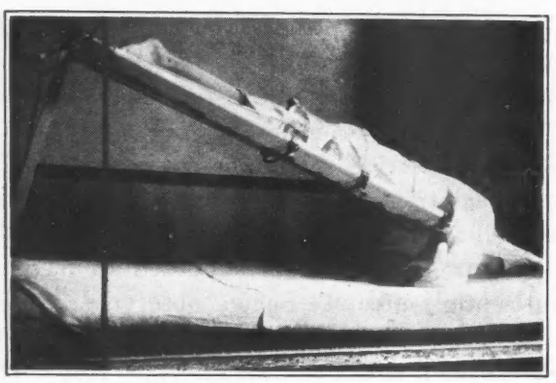


FIG. 7

devised. It holds the child with the head down and the afflicted side uppermost. This position is maintained constantly. The children on these frames are sent to the country hospital, where fresh air and sunshine improve their general condition. Occasionally the position must be worked up to, too rapid a placement causing nausea and vomiting. The chief criticism against this method is the prolonged hospitalization it requires, four or five months at least. This narrows its application because of the expense. The children feel comfortable and are generally well. Drainage is good at first, but little sputum is brought up later, possibly because the abscess has been emptied. It is hoped that the maintenance of the position will keep the abscess empty and thus give it an opportunity to heal. Its chief indication is in the treatment of those cases in which the other measures suggested are contraindicated.

SUMMARY

A brief survey of 56 cases of bronchiectasis is given. The frequency of the disease when sought for and the superior merits of prophylaxis are stressed. The treatment suitable for established cases is outlined.

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HERPES ZOSTER WITH VARICELLA.—R. R. McCormick discusses four cases of herpes zoster that occurred among persons in contact during an epidemic of varicella. During the course of the herpes zoster in one case a generalized vesicular eruption developed on the twelfth day. This eruption closely resembled varicella. This generalized eruption was extensive, involving the skin of the entire body and the mucous membranes. Varicella, ordinarily a very mild infectious disease, occurring during the course of a herpes zoster, produced a fatal sepsis due to extensive gangrene of the skin. No cases of varicella developed from contact with this case during the period of the generalized eruption. An infant, aged 19 months, inoculated with vesicular fluid, developed a slight local reaction. This infant has since been exposed to cases of varicella in children and has not developed any vesicular eruption. The virus or viruses attack the epiblastic structures. Necropsy observation in lesions of the skin showed severe inflammatory and gangrenous involvement of all layers of the skin. The necropsy on the central nervous system revealed extensive pathological involvement of the posterior root ganglions and the posterior half of the spinal cord—a posterior poliomyelitis.—*J. Am. M. Ass.*, 1931, **96**: 766.

PARASITIC INFESTATION OF NOSE.—Harold Liggett describes a case of infestation of the nose with larvæ of the black carpet beetle (*Attagenus piceus* Oliv), an insect that infests carpets, mattresses and blankets. These larvæ are exceptional in that they take two years to reach the adult stage. The insects were never seen *in situ* except on first examination by posterior rhinoscopy. But the appearance of larvæ immediately following a sphenoid irrigation places them somewhere in the sphenoid-ethmoidal recess. It is very possible that the larvæ lodged in the sphenoid sinus, especially since only recently closer observation of the first return flow from the right sphenoid sinus revealed a tiny parasite, small enough to have escaped notice originally. The mother bettle must have crawled in and deposited her eggs in a dark and inaccessible location. This could well have been the ethmosphenoid recess. The larvæ after hatching crawled around the nasal cavity and accessory sinuses, spreading the subsequent rhinitis and sinusitis.—*J. Am. M. Ass.*, 1931, **95**.

PHLEGMONOUS GASTRITIS*

WITH A REPORT OF FOUR CASES

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WITHIN the last three years four cases of phlegmonous gastritis have been met with in the post-mortem services of the Montreal General, the Royal Victoria and the Notre Dame Hospitals of Montreal.

Following are summaries of the clinical records and autopsy protocols of these four cases.

CASE 1

This patient was a male, aged 19 years. During the summer of 1929 he had complained of a dull ache in the epigastrium before and after meals. Early on the morning of November 22, 1929, he was awakened by severe cramp-like pains in the epigastrium, immediately followed by vomiting. The pain in the epigastrium persisted and vomiting was frequent. He was admitted to the Royal Victoria Hospital on November 24th, into the service of Dr. E. W. Archibald. The attending physician, Dr. Mark Kaufman, made a tentative diagnosis of perforated peptic ulcer with acute peritonitis and an exploratory laparotomy was immediately performed. At operation thick greenish, purulent material was seen to flow from the sub-hepatic region. A right-sided hydronephrosis was noticed and twenty ounces of clear amber fluid were withdrawn therefrom. After operation the patient was in a state of severe shock and died four hours later. Culture of the purulent material seen at operation revealed hæmolytic streptococci. A chemical blood examination showed marked nitrogen retention.

At autopsy the stomach and kidney were the site of the following lesions. The stomach was large and dark reddish brown in colour. There were numerous subperitoneal hæmorrhages over the whole surface, most marked along the greater curvature. The wall throughout was boggy, œdematous and markedly thickened (about 2 cm.). The mucosa was covered with greyish, turbid fluid, containing finely granular suspensions. The normal rugæ of the mucosa had disappeared and were replaced from cardia to pylorus by deep longitudinal troughs. Microscopic sections proved that the thickening of the wall was mostly the result of a marked œdematous swelling of the submucosa (Fig. 1). Scattered diffusely throughout and extending between the bundles of the muscular coat were abundant leucocytes (pus). The mucosa was relatively well preserved with a much slighter infiltration of leucocytes. Sections through the pylorus (Fig. 2) showed an even denser infiltration of the submucosa and muscular coats by the leucocytes, to such an extent that the tissue structures had almost completely disappeared (necrotic fusion) and the picture resembled that of an abscess. There was an abrupt cessation of the swelling at the pyloric orifice, though the duodenum still showed a moderate infiltration of the wall by leucocytes. A Gram's stain on a section of the stomach wall disclosed many large Gram-positive cocci arranged in long chains. Autopsy further revealed greenish purulent material in the right paracolic area which flowed into the pelvis. The peritoneum everywhere was smooth and glistening, except for a thin fibrinous deposit on the serosa of the stomach.

The kidneys were fused at their lower poles and formed a typical large hydronephrotic horse-shoe organ. On opening them they presented large dilated thin-walled excavations of the renal substance with very little apparently normal kidney tissue remaining. Even these remains showed, microscopically, exudative and productive changes and kidney obliteration.

The anatomical diagnosis of the gastric condition was phlegmonous gastritis, with exudative purulent peritonitis.

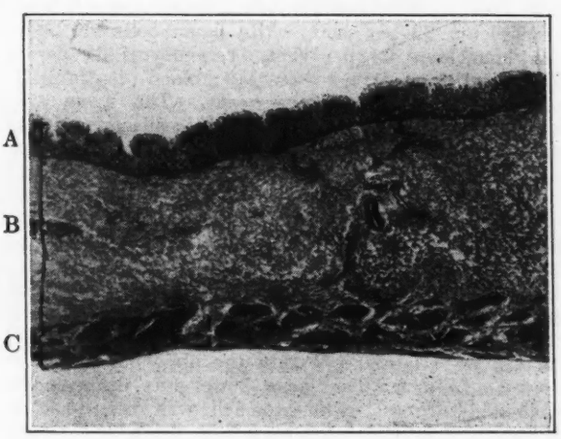

FIG. 1.—*Case 1.* Stomach wall. (x 2½). A—mucosa; B—enormously swollen submucosa; C—muscularis.

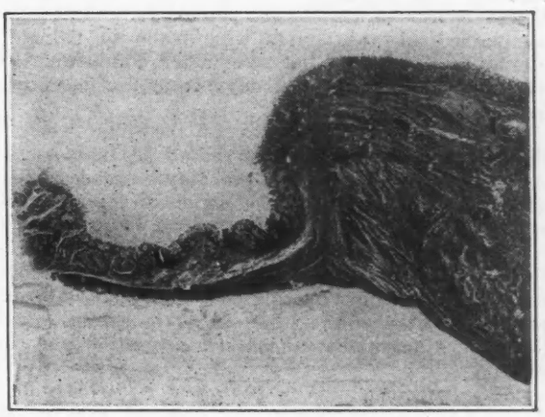

FIG. 2.—*Case 1.* Pyloric region (x 2½). To the left is the duodenum, to the right the greatly thickened stomach wall.

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CASE 2

Mrs. T. F. B., (hospital number 6787/27) aged 34 years, was admitted to the Gynæcological service of Dr. H. M. Little at the Montreal General Hospital with a tentative diagnosis of post-partum pelvic inflammation with probable septicæmia. The patient was a V-para. She had been delivered spontaneously of a full term living child twenty days prior to admission and had passed ten days of apparently normal puerperium. On the tenth day she suddenly developed a chill, fever, and severe pain in the lower abdomen, which became progressively worse to the time of admission, which was ten days after the onset and twenty days after the delivery. She gave a history of hunger pains, and a sensation of "knotting" in the upper abdomen for the two years previous, for the relief of which she had been in the habit of taking food at frequent intervals. She had had also some pains in the lower abdomen which was attributed to ovarian trouble.

On admission the patient was obviously acutely ill. She was drowsy but could reply weakly and in an intelligent manner to questions. The countenance was placid; the skin and mucous membranes were jaundiced and the alæ nasi moved with respiration. The pulse was 60, full and regular; the temperature was 101.2°. There were signs of bronchopneumonia at the left base. There was a mass in the abdomen filling the area from the xyphoid to a point 3 cm. below the umbilicus. Its lower margin could be well defined. It was soft, slightly movable, and not tender to deep pressure. The surface was smooth and round and the area over it was tympanitic. The upper abdomen was somewhat more resistant than the lower, but at no point was there splinting. The lower abdomen was perfectly relaxed. Pelvic examination showed a slightly relaxed outlet. There was a definite watery discharge which was not foul. The cervix was firm, but not completely closed. The uterus was slightly enlarged, retroflexed and fixed. There was no thickening of the broad ligament structures and no tenderness on palpation or movement. Some slight peritoneal tenderness was elicited per rectum and the patient complained when attempts were made to palpate the uterus. She vomited but once after admission, twenty days post-partum and ten days from the onset of the last illness.

The clinical impressions at the time were: (1) Bronchopneumonia at the left base; (2) a mass in the upper abdomen which was probably distended stomach or localized peritonitis in the region of it; (3) a retroverted, subinvoluted uterus.

Autopsy summary (A-27-314).—The uterus was found subinvoluted and retroverted, but otherwise normal for the period of puerperium. There was bronchopneumonia at the left base; a septic spleen; and the liver and kidneys showed marked congestion and cloudy swelling.

The peritoneal cavity contained a turbid yellowish fluid and the peritoneum was covered with a slight fibro-purulent exudate. There were no adhesions. The stomach was obviously swollen, greatly enlarged and distended, felt firm and rubbery, and its surface was covered by a slight exudate of an opaque yellowish colour. On section the wall was seen to be enormously thickened, measuring 1.5 to 2 cm. The cut surface was pale and on pressure exuded a phlegmonous material, particularly from the submucosa. The mucosa was smooth, pinkish yellow, contained many petechial hæmorrhages, and was thrown into coarse rounded folds in the long axis of the stomach. The normal rugæ had entirely disappeared. There was no evidence of ulcers of any description. The thickening was seen to stop short at the cardiac and pyloric orifices.

Microscopic sections showed an extensive œdema and polymorphonuclear leucocyte exudation throughout, separating widely the glands in the mucosa and the fibres in the muscularis. The submucous and subserous spaces, especially the former, were greatly distended. The exudate was also seen on the peritoneal surface. Although in the gross the swelling stopped at the pyloric ring, microscopically the cellular exudate extended a short distance into the duodenum. Gram-stained sections of the stomach revealed enormous numbers of streptococci and a hæmolytic streptococcus was recovered from both the peritoneal exudate and the exudate in the stomach wall.

The pathological diagnosis was acute diffuse phlegmonous gastritis, with generalized peritonitis.

CASE 3

A. E. M., (hospital No. 5685/29), a male, aged 63 years, a travelling salesman, of good habits, was in good health until two years prior to his last illness when he had an attack of pneumonia. Following that illness he had had some dyspnœa and he was told that he had albumin in his urine. Following a strain of his back in 1927 he developed a chronic osteoarthritis of his lumbar spine for which he was treated in the Western division of the Montreal General Hospital in the summer of 1929. At that time his blood pressure was 170/80. There were albumin, and hyaline and granular casts in the urine. He improved on treatment and was discharged on September 1, 1929.

On September 28, 1929, he felt nauseated and vomited blood streaked stomach contents. The next day he again became nauseated and vomited about one quart of dark red clotted blood. On September 30th, two days after the onset of his present illness, he was admitted into Dr. Campbell Howard's service at the Montreal General Hospital. The patient was semi-comatose, very pale and appeared to be in constant pain. The abdomen was somewhat distended and rigid. There was no evidence of fluid or of masses in the abdomen and no distension of the superficial veins. The lungs were clear. The heart was enlarged and there were hæmic murmurs. The temperature was 102°; the pulse 112; the respirations 28. Red blood cells 1,500,000; hæmoglobin 32 per cent, white blood cells 9,000; polymorphonuclears 66 per cent, lymphocytes 34 per cent. The blood urea nitrogen was 119; blood creatinine 2.36; and blood sugar 0.178 per cent. The urine showed albumin, few pus cells, no red blood cells or casts. The man's condition grew steadily worse and the following day he developed a purulent meningitis. On October 2nd he passed about one quart of blood by the bowel and shortly afterwards died, on the fourth day of the acute illness.

Autopsy summary (A-29-231).—The condition of chief interest was the phlegmonous gastritis which is described below. Permission was not obtained to open the head or spinal canal, so the meningitis was not further investigated. Within the abdomen the findings were as follows. The large bowel was distended with blood and fæces. The stomach was not abnormally dilated. It occupied its normal position and relations. Over the proximal 8 cm. the peritoneal vessels were dilated, the capillaries stood out prominently and were easily seen with the naked eye. The peritoneum was tense, had lost its normal lustre, and there were numerous small patches of greyish fibrin attached to the surface. The walls were thickened and stiff and did not tend to collapse. The remainder of the stomach externally appeared normal. The line of demarcation between the involved and uninvolved area was not sharp. Over the lower 3 cm. of the œsophagus the superficial vessels were dilated, but there was no exudate. In the involved area the wall measured almost half a centimetre at its thickest point and gradually thinned out towards the normal pyloric portion.

There was a striking difference between the mucous membrane of the fundus and that of the pyloric region. In the fundus it was firmer, swollen, œdematous and tore easily. The capillaries were dilated, there were

numerous small greyish areas of necrosis, with here and there minute submucous hæmorrhages, and the normal mucosal folds were entirely absent. The mucosa of the remainder of the stomach and in the duodenum appeared quite normal. The wall of the distal 3 cm. of the œsophagus presented an appearance similar to that of the fundus of the stomach. At its thickest point, near the cardiac orifice, it measured 0.5 cm. The mucosa of this portion of the œsophagus resembled that of the fundus, but in addition there were three linear ulcers in its long axis (Fig. 3). They were equidistant apart

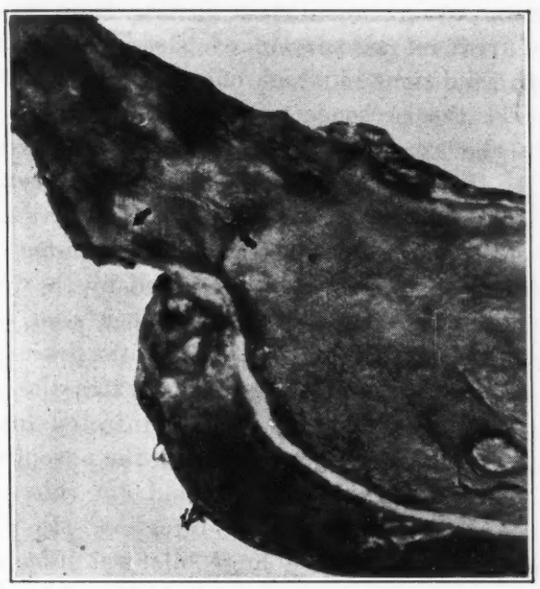

FIG. 3.—*Case 3.* Stomach and lower end of œsophagus. Note the thickened stomach wall, the smooth velvety mucosa, and the three linear ulcers in the lower end of the œsophagus.

and measured 1, 1.3 and 1.5 cm. respectively. The largest ulcer, which was 0.3 cm. in breadth, involved a thrombosed œsophageal vein. There is no doubt that it was from this lesion that the acute hæmorrhage took place.

Gram-stained smears from the stomach wall revealed streptococci and Gram-negative bacilli, the former predominating, and there was marked phagocytosis of this organism. Cultures grew only *B. coli*, which was probably a post-mortem invader. Gram-stained sections of the stomach and œsophagus showed enormous numbers of streptococci.

The pathological diagnosis was phlegmonous gastritis and œsophagitis with necrosis and ulceration of the lower end of the œsophagus, eroding a vein with resulting fatal hæmorrhage; and fibrino-purulent peritonitis.

CASE 4

Mrs. E. G., aged 42, a well developed, well nourished woman was admitted to the Notre Dame Hospital into the service of Dr. Benoit at 6.50 a.m. on April 25, 1927, in a moribund condition. The temperature was subnormal, the pulse imperceptible, and the body was bathed in cold sweat. Agonal râles were heard all over the chest. There was some sensitivity in the epigastrium, but no rigidity. The only history obtainable was that the illness began two days previously, with vomiting and marked prostration. The diagnosis was acute gastritis. Death occurred twenty minutes after admission.

At autopsy (No. 30/34) the pathological condition of importance was a phlegmonous gastritis and a purulent peritonitis. The peritoneal cavity contained 100 c.c. of pus. The peritoneum was congested, but retained its shiny surface. The stomach condition was identical with that found in Case 2, and an abundance of streptococci were found in Gram-stained sections of the stomach tissues.

DISCUSSION

Although nearly always fatal, there have been some cases of phlegmonous gastritis which have been cured by surgical treatment. The disease presents, therefore, an occasional diagnostic problem of importance. It is a rare condition and is rarely ever diagnosed before the abdomen is opened.

In 1919 Sundberg[5] reviewed 215 cases. Gerster,[2] in 1927, collected 48 additional cases. To these two comprehensive articles special reference should be made. Since 1927, some twenty-odd additional cases have appeared in the literature. Five of Gerster's cases were found among 5,200 autopsies at Mount Sinai Hospital, New York. In 1927 there appeared in Guy's Hospital Reports the first case to occur at that hospital in more than thirty years and a second case was reported in 1929. Lawrence[3] reviewed 5,000 autopsies at the Massachusetts General Hospital and found only 2 cases.

Of the four cases herein described, No. 1 was the second case encountered in 4,188 autopsies at the Royal Victoria Hospital in the past 20 years. At the Montreal General Hospital there have been observed 4 cases, including Nos. 2 and 3, among 9,300 autopsies in the past 34 years. One of the remaining two was reported by Baird[1] in 1911. The fourth case is the only one on record at Notre Dame Hospital.

PATHOLOGY

The whole stomach wall is usually involved in an acute diffuse suppurative process, but more attenuated and localized forms are met with, sometimes in the form of a frank abscess which may rupture into the stomach or peritoneal cavity. Viewed *in situ*, the stomach retains its normal position and may or may not be distended. It is obviously swollen and its normal translucent shiny surface has assumed an opaque pale yellowish or brownish appearance. The capillaries are congested and there may be subserous hæmorrhages and a fibrino-purulent peritoneal exudate. On palpation it is stiffened and of a boggy or rubbery consistency. The wall may be thickened to as much as 2 cm. or more (see Fig. 1). In the gross, this

swelling appears to end abruptly at the orifices (see Fig. 2), but microscopically the cellular exudate is often found to extend into the œsophagus or duodenum. On section, the thickening is seen to be due to an enormous swelling of the submucosa, from which a phlegmonous material exudes. The mucous surface presents a swollen velvety appearance, and is covered by exudate and mottled by hæmorrhages. If the swelling is marked the normal rugæ are replaced by large folds running in the long axis of the stomach.

Microscopically, all the coats are more or less involved in an acute œdematous and purulent process which is most noticeable in the submucosa because of its very loose texture. Hæmorrhagic areas are commonly seen. Various degrees of ulceration and necrosis may ensue. However, the mucosa is usually intact. The exudate nearly always extends through the peritoneum and may spread into adjacent organs. The infecting organisms can usually be easily demonstrated in the stomach wall. Associated lesions are those usually found in severe pyogenic infections. Of the four cases here reported, the first two and the fourth are typical examples of acute diffuse phlegmonous gastritis. The third is unique in that the lesion was confined to the cardiac half of the stomach, had involved the lower end of the œsophagus, and an ulcerative process had eroded an œsophageal vessel causing fatal hæmorrhage (Fig. 3).

Peritonitis, due to direct extension from the stomach, is present in 70 per cent of cases (Sundberg). Bronchopneumonia, left-sided pleurisy and pericarditis are not infrequent complications. All four of our cases had peritonitis; the second had bronchopneumonia and a streptococcic meningitis. The infecting organism is usually a streptococcus. Sundberg states that streptococci were found in 71 of 95 cases examined bacteriologically. Other organisms reported are the pneumococcus, *B. ærogenes capsulatus*, hæmolytic staphylococcus and *B. coli*. Streptococci were recovered from all of our four cases.

Concerning the mode of infection the cases fall into two classes:

1. Secondary.—In this group, of which there are about 50 cases reported, there is present an obvious lesion from which the suppurative process spreads. Such lesions are malignant or peptic ulcers, infected operation wounds in the stomach, or abscesses in adjacent tissues or organs.

2. Primary or idiopathic.—The majority of cases fall into this class. The route of infection is more uncertain. The infecting organism must gain entrance to the stomach wall, either through the mucosa or by way of the blood stream from some distant focus. Because of the frequent association of gastric phlegmon with conditions in which one might reasonably expect the presence of a blood infection, it must be assumed that the organisms usually reach the stomach by way of the blood stream.

That organisms may pass through the stomach mucosa in cases in which infective material is swallowed is suggested by the fact that phlegmonous gastritis has been seen following stomatitis, purulent bronchitis, drainage of abscesses in the oral pharynx, extraction of carious teeth and the eating of infected food. In these instances, however, with the exception of the last mentioned, one could not rule out the blood stream route of infection. In our first case there was a huge bilateral infected hydronephrosis of a horseshoe kidney. In the second case the patient was at the tenth day of puerperium, when her last illness commenced. Although the uterus appeared normal for this period, it is probable that the organism gained entrance to the blood stream through the birth canal. In the third case there was a chronic osteoarthritis of the spine. However, no focus of infection from which it or the gastritis could be derived was found either by clinical or autopsy examination. In our fourth case there was no suggestion of any focus of infection whatever.

During an epidemic of puerperal sepsis in Prague, in 1847, several cases of phlegmonous gastritis were noted (Gerster). Cases also have been seen following erysipelas, small-pox, scarlet fever, furunculosis, pyæmia and acute polyarthritis.

Steida[4] claims that there is a definite relation between low stomach acid values and phlegmonous gastritis. It is worthy of note, however, that we have not seen a report of a single case associated with pernicious anæmia in which hypoacidity of the stomach contents is so constant. In none of our four cases was a gastric analysis done. Chronic gastritis was a feature

of many of the cases reported. Sundberg states that there was a history of catarrhal gastritis in all of his 17 cases. In 9 of the 48 cases collected by Gerster there was a history of indigestion for a month or more preceding the acute onset. Of our cases Nos. 1 and 2 had had gastric disturbances for several months and two years respectively. Acute gastritis is probably a predisposing factor in those cases which occur in the course of any of the acute infectious diseases. Debilitating conditions are regarded as important predisposing causes. Cases Nos. 1 and 3 had renal insufficiency and were generally in poor health, but cases Nos. 2 and 4 were apparently in good general condition.

The symptoms are usually those of a severe toxæmia. In the fulminating type there is vomiting, chills, high fever, rapid pulse, coated tongue and extreme prostration, which ends fatally in a few days. In less severe cases the illness may be of two or three weeks' duration. Epigastric distress, pain and tenderness are usually present and, if the peritoneum is involved, there is rigidity. The swollen stomach may be palpable, as in Case 2. Gastric distention is common. Gastric secretion is diminished. The vomitus may be purulent and may contain shreds of necrotic tissue and varying amounts of blood. In Case 3 the vomiting of a large amount of blood was an early symptom and finally hæmorrhage was the immediate cause of death. In cases of infection with a hæmolytic organism, jaundice may be marked.

PROGNOSIS

The prognosis is extremely grave. Ninety-two per cent of all untreated cases end fatally (Sundberg). In the three hospitals in which the four cases here reported occurred, there are no cases on record other than those which came to autopsy. Spontaneous recovery is known to occur. It is probable that many less severe cases pass unrecognized and do recover.

That phlegmonous gastritis is the etiological factor in certain cases of gastric fibrosis and contractures is suggested by the case of Stapelmohr quoted by Gerster. "A woman of 48 years was operated on eleven days after the onset of symptoms. A phlegmonous gastritis was found, the inflammation involving the omentum, transverse colon, mesocolon and gastro-colic ligament. Pus aspirated from the stomach wall showed streptococci and *B. subtilis*. Five years later, examination of the patient, who was then in good health, revealed absence of free hydrochloric acid and an hour-glass contraction of the lesser curvature."

Surgical treatment may cure some of the more attenuated and localized forms. Gerster summarizes 54 cases treated surgically by such procedures as gastrostomy, gastro-enterostomy, jejunostomy, resection, and drainage of abscesses. There were 13 recoveries and 41 deaths. The most favourable operation was that of resection where there were 8 recoveries and 10 deaths.

To Professor Simard, Pathologist to the Notre Dame Hospital, Montreal, we are indebted for permission to include in this report, Case 4. Our thanks are due to Professors Oertel and Rhea in whose departments this work was done and who so kindly reviewed our manuscript.

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AIR TRAVEL MAY SPREAD YELLOW FEVER.—The possible spread of dreaded yellow fever by air travel, says *Science Service*, was discussed at the Pan American Conference of directors of health, which met in Washington recently. New discoveries have shown that control of yellow fever is not so certain as it once appeared, and the speed of air travel adds greatly to the hazards which public health officers must fight in keeping down this disease. Discovery that thirteen varieties of mosquitoes, instead of one, are susceptible to yellow fever and may spread the disease complicates the situation enormously. It means, among other things, that countries which thought themselves safe because they were fighting the Ædes ægypti mosquito are no longer safe. India, for instance, with its teeming millions of uneducated people, has so far been free of the disease. But the mosquitoes capable of transmitting it exist in India, and just one unsuspected or uncontrolled yellow fever patient might start an epidemic of horrible proportions. Another disturbing discovery has shown that many people have such light attacks of yellow fever that it is not recognized. They may actually become unrecognized carriers of this disease for a short time. A new test devised by Rockefeller Institute scientists shows whether or not a person has had yellow fever. This test will undoubtedly be of great value to the health authorities in their endeavor to develop improved methods for quarantine, control, and prevention.—*The Diplomate*, 1931, **3**: 30.

Clinical Conferences

CORTICAL ADRENAL TUMOUR

A Clinical Conference at the Winnipeg General Hospital,

BY DRS. HUNTER, MCMILLAN, BOYD AND CAMERON,

Winnipeg

DR. CHAS. HUNTER: Miss B., aged 30, was admitted to the Winnipeg General Hospital under my care on April 24, 1931, complaining of weakness, loss of weight, pain in the back, amenorrhœa, shortness of breath and swelling of the feet and legs.

Family history.—Irrelevant.

Personal history.—She was born in Germany, had a thyroidectomy in 1922, apparently for simple goitre, and an operation for varicose veins in 1924. Menstruation began at 12 and was regular, with moderate flow for 3 to 5 days until the age of 18, when it ceased for 6 months, again becoming regular. Otherwise, she was quite healthy until she came to Canada in September, 1929. Soon after arrival she began to suffer from backache in the lumbar region, with some swelling of the feet and ankles, for which she was seen once in October, 1929, at the outpatient department of the Winnipeg General Hospital. She was then very obese, with a florid face, dry scaly skin, marked acne, "virilism", considerable œdema of the legs, a rather rapid but otherwise normal heart, systolic blood pressure 185, with diastolic 122; urine, specific gravity 1007, no albumin or sugar, with an occasional pus cell, microscopically; blood examination gave 5,570,000 red cells and 109 per cent hæmoglobin; the Wassermann test was negative. A tentative diagnosis of chronic glomerular nephritis was made.

Unfortunately, she did not return to the outpatient department, but continued in domestic service, feeling pretty well, though with some backache. In November, 1929, menstruation ceased abruptly and has not reappeared. She had been teased, as a girl, because she had a little hair on her face; from April, 1930, a very marked development of hair appeared on the face and to a less extent on the trunk and extremities. In September, 1930, she began to feel rather weak and tired; the pain in the lumbar region increased in January, 1931, so that she could not bend, and for this reason she entered the Victoria Hospital, where she was treated for lumbago with baking and hot baths, being transferred after two weeks to a convalescent home. The backache continued; she began to rise two or three times at night; she lost steadily in weight from 180 pounds (her weight on entering Canada) to 135

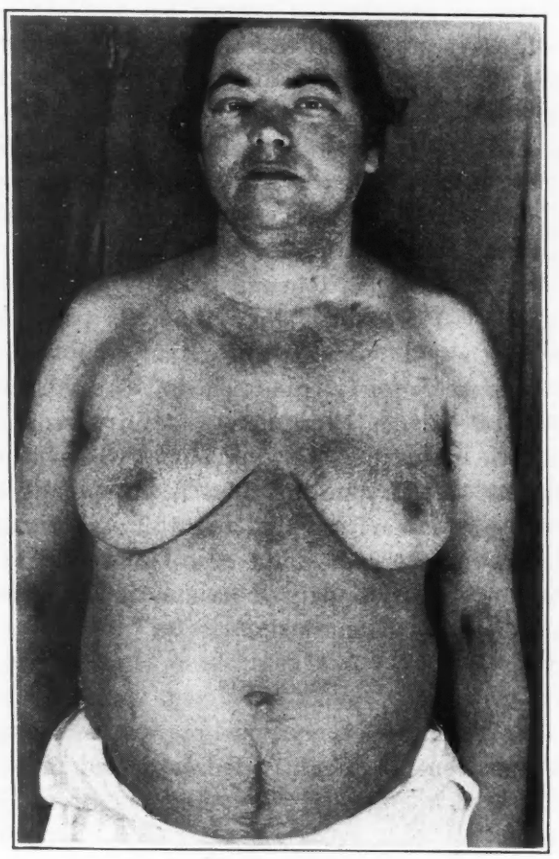


FIG. 1

pounds in April, 1931, in spite of a good appetite. In February, 1931, she became short of breath on climbing stairs and required an extra pillow in bed, while the swelling of the legs became more marked.

Present condition.—You see (Fig. 1) a strongly built, stout woman, of 5 ft. 2 in.; face broad, weather-beaten, red and puffy; thick, coarse, black hair runs down in front of the ears to the chin; on the upper lip and under

the chin, the hair is less marked; the eyebrows are very thick; the hair of the head is dark brown, short, thin and fine; the head small and unusually round; the broad, powerful chest and protruding abdomen contrast sharply with the small, narrow buttocks and comparatively thin, masculine looking lower extremities, which assume, especially below the knee, a dull, brick red colour on standing. The skin, too, is coarse and dry, with much acne on the back; the pubic hair is thick and extends in masculine fashion towards the navel, while there is considerable hair between the breasts, below the clavicles and over the lower cervical and upper dorsal vertebræ; on the thighs the hair is thick and coarse, less so on the legs and upper extremities. The œdema of the lower extremities, present on admission, disappeared with a couple of days' rest in bed; a couple of brown pigmentary patches are seen on the legs. Her back has lost the usual lordotic curve—the lower dorsal and lumbar vertebræ project slightly backwards, but are not particularly tender on pressure; there is marked impairment of movement in the lumbar spine, the patient raising herself with great difficulty into the sitting position and able to bend forward and laterally only to a limited extent. There is a thyroidectomy scar with no obvious remains of the thyroid gland; the breasts are normally developed.

The systolic blood pressure varies between 170 and 185, with a diastolic of 120; the arteries are not specially thickened. The heart seems slightly enlarged and is always increased in rate, 100 or over, but is otherwise negative. The lungs are negative. The patient has a partial upper plate with 5 remaining teeth above and 8 below in front, all comparatively healthy. The abdomen is broad and protruding, a little more so on the right side, with the superficial veins on both side of the lower portion somewhat prominent, the veins extending on the right side upwards towards the outer margin of the right breast; numerous striæ atrophicæ are present on the lower abdomen. A mass, considerably larger than a fetal head, can be readily felt in the right upper abdomen, smooth, painless, unconnected with the liver, though its upper limit cannot be reached, with bowel in front, moving slightly with respiration. The tumour is evidently connected with the right kidney. The spleen is not palpable; there is no ascites; the urine varies in specific gravity from 1012 to 1015; marked albumin is present and a small but varying amount of sugar; microscopically, a few pus cells; no blood or casts present on repeated examination.

The patient is bright and mentally active, though sometimes rather depressed about her condition; her voice is rather husky, but feminine in type. General examination of the nervous system is normal; the fundus however, shows arteriosclerosis, with many spots of retinal œdema and a small hæmorrhage above the macula in the left eye. The pelvic examination by DR. CHAS. BURNS, shows the external genitalia to be normal, save for a definitely enlarged and curiously hard clitoris; the vagina is filled with a polypoid mass protruding through the cervix; while a plum-sized mass, attached to the posterior wall just at the outlet, was readily detached with the finger, causing some hæmorrhage in the next 24 hours. The uterus and ovaries cannot be satisfactorily palpated without an anæsthetic.

The diagnosis of the *main* pathological condition is obvious from the history and ordinary physical examination before confirmatory laboratory tests are made. This point is emphasized in view of the modern tendency to substitute laboratory diagnosis for the safer but more time-consuming bed-side examination. When menstruation disappears, when hair of the masculine type of distribution develops profusely in a young woman of buffalo-like disproportion of shoulder and buttock, who exhibits a large tumour in the renal region and a hypertrophied clitoris—*tumour of the adrenal cortex* is the probable diagnosis.

Special examinations.—Investigation of the *renal function* showed decided impairment. The specific gravity of the urine tended to remain below 1016; casts and blood were absent; albumin was always present; day urine 1580 c.c. and night 500 c.c. (the presence of sugar complicated the situation); blood urea nitrogen 15, and later 17 mg. per 100 c.c. blood; blood urea clearance test gave 44 per cent (and in the second test, 36 per cent) of the average normal (a figure, according to Van Slyke, indicating marked renal impairment); phenolsulphonephthalein test gave only 13 per cent of the dye in 2 hours (in the

second examination, 14 per cent); Bence-Jones protein test, negative. Dr. Morse, on cystoscopic examination, found "the function of both kidneys equal; the right pyelogram shows marked displacement of kidney downwards as well as considerable distortion of pelvis and calyces—more so than would be caused by pressure alone and which would indicate involvement of renal tissue."

Blood.—Red cells 4,360,000, hæmoglobin 75 per cent, colour index 0.87, leucocytes 15,750, with 88 per cent polymorphonuclears, 7 per cent small lymphocytes and 5 per cent monocytes; Wassermann test, negative; the fasting serum calcium was 9.5 mg., the fasting plasma phosphate 2.6 mg. per 100 c.c. (figures slightly subnormal), the fasting blood cholesterol, 333 mg. per 100 c.c. All the blood examinations were controlled by Professor Cameron. The fasting tolerance test with 108 grams of glucose gave 0.17 per cent fasting blood sugar and 0.32, 0.37, and 0.36 after 1, 2 and 3 hours respectively, thus indicating a definite diabetes mellitus.

The electrocardiogram showed left ventricular hypertrophy with inverted T wave in the first and iso-electric in the second lead. The basal metabolic rate was plus 22 on May 4th and after a week in bed, plus 4 per cent.

DR. J. C. MCMILLAN, *x-ray findings.—Chest*: the right diaphragm is elevated, being one and one-half intercostal spaces higher than the left. It has the normal curve, which would suggest that the displacement is due to some increased intra-abdominal pressure. The left side of the diaphragm is normal; there is slight increase in the size of the heart and shadows of the great vessels; there is a clear-cut, circular, opaque area in the lateral part of the right lower chest, just above the diaphragm, which has very much the appearance of a metastatic lesion from a malignant kidney. The remainder of the lung fields is clear. (Fig. 2).

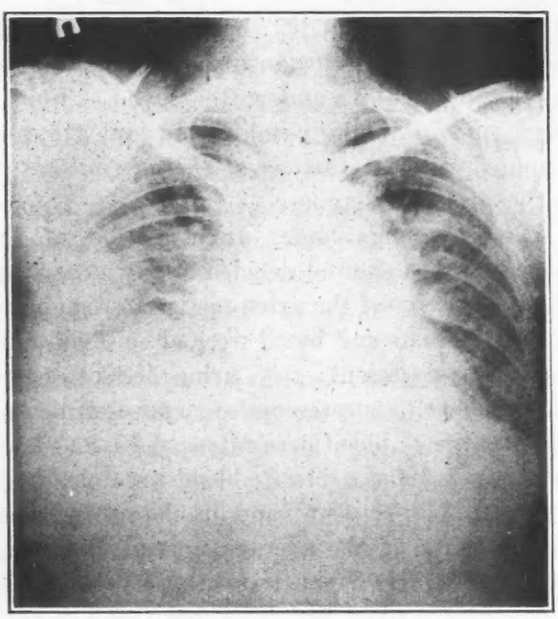


FIG. 2.—Miss B. X-ray chest showing metastases in right lower chest.

Spine.—There is marked decalcification of the bodies of the last dorsal and of all the lumbar vertebræ. The bodies of these vertebræ are more or less collapsed, the third being the least deformed. It is interesting to note that the movable portion of the spine closest to the fixed portion shows the greatest deformity. The osteolytic changes usual in metastatic bone lesions are not present. The appearance of these vertebræ would suggest a general softening with resulting compression. (Fig. 3). The remainder of the spine and the pelvic bones are normal.

FIG. 3.—Miss B. Lumbar spine showing decalcification and compression of the 12th dorsal, and the lumbar vertebræ.

Long bones and bones of skull.—Apparently normal; the sella turcica is apparently normal in size, but the posterior clinoid processes are slightly indistinct.

Urinary tract.—The left kidney shadow is distinctly seen, but the right is not. There is a small circular shadow superimposed on the ninth rib posteriorly and well out from the

middle line. A pyelogram (Fig. 4) made on the right side shows the pelvis and calyces to be well visualized. The kidney is apparently displaced downwards and the upper pole rotated outwards. The upper calyx shows some deformity, more than one would expect from external pressure and would suggest tumour involvement of the upper pole. The shadow in the upper right quadrant, mentioned above is apparently not in the kidney. On a lateral film, this shadow is well anterior and could very well be a gall-stone.

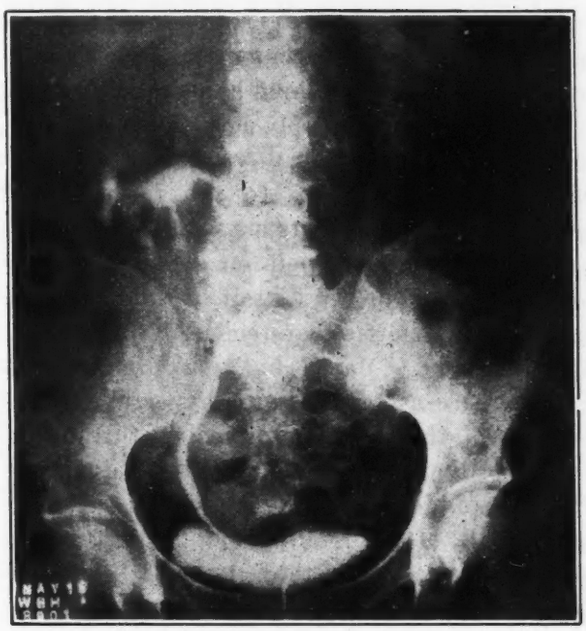


FIG. 4.—Miss B. Right side shows kidney axis horizontal and depressed downwards. There is some compression of the upper calyx.

Gall-bladder.—The gall-bladder examined by means of the Graham dye test, does not visualize.

PROF. WM. BOYD.—The tumour removed from the vaginal wall is round in outline, of firm consistence, and measures 2.25 by 4 cm. It consists of sheets of large polyhedral cells which in some places show an alveolar grouping into columns and strands very much like that of the adrenal cortex (Fig. 5), but in other places are arranged more diffusely. Most of the cells are of uniform size, but some are larger with two or three nuclei, and there are a few giant cells with multiple nuclei. The latter are often seen in tumours of the adrenal cortex. For the most part the cytoplasm is granular, but in places the cells have a remarkably clear or vacuolated cytoplasm, like that of a renal hypernephroma (Fig. 6). There is none of the glandular arrangement and papillary formation often seen in that tumour. These clear-celled areas are highly vascular, whereas the rest of the tumour is comparatively avascular.

Malignant tumours of the adrenal may be called adrenal carcinoma or malignant hyper-

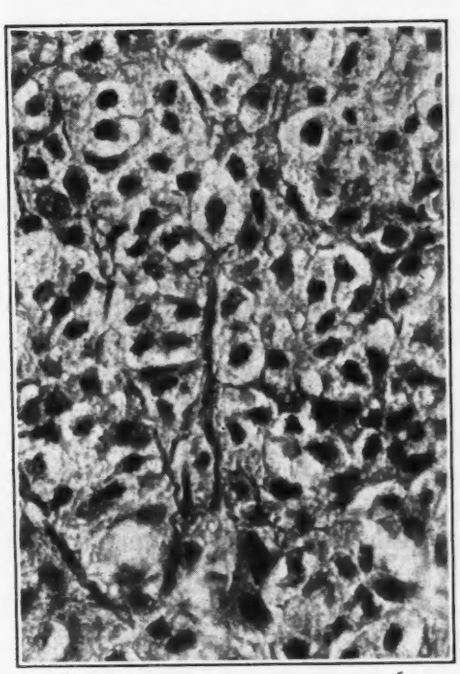


FIG. 5.—Metastasis in the vaginal wall. The cells have granular cytoplasm, and show a definite alveolar grouping. (x 425).

FIG. 6.—Another area showing cells with very clear cytoplasm. (x 425).

nephroma. As the term "hypernephroma" is commonly applied to the Grawitz tumour of the kidney, the relationship of which to the adrenal is quite doubtful, it seems better to speak of adrenal carcinoma. The adrenal cortex, it is true, is of mesoblastic origin, so that on histogenetic grounds, sarcomatous growths might be expected, but the cortex has acquired epithelial characteristics, and these are shared by the malignant tumours which arise from it. In some of the most highly malignant and atypical forms of tumour, there seems to be a reversion to the mesoblastic type. These tumours are highly invasive and usually of rapid growth. They invade the surrounding parts, the kidney and the veins, so that metastases are numerous and widespread. Kaufman records a secondary growth in the uterus, which is of interest in view of the site of the metastases in the present case. It is seldom that the bones are involved by the secondary growths. This is in striking contrast to the great frequency of bone metastases in renal hypernephromas. There may be a tumour in the other adrenal, and the lymph nodes may also be invaded.

PROF. A. T. CAMERON.—While it has long been recognized that the adrenal cortex is essential to life, only within the past few years has definite experimental evidence been adduced that the cortex elaborates an internal secretion, which is in some way associated with muscular function. To Gustav Kuhl, to Hartman, and especially to Swingle and Pfiffner, we are indebted for the preparation of cortical extracts and for the demonstration that they are active in counteracting the effects of adrenalectomy. Swingle and Pfiffner have succeeded in preparing highly potent extracts, free from adrenine, which will not only prolong the life of an adrenalectomized cat from the normal 10 days to more than 100 days, but which can be used successfully by mouth or by injection in combating the crises of Addison's disease, of which, it will be remembered, one of the characteristic features is a marked asthenia. While there is therefore definite experimental evidence that there is a normal association between muscular function and the secretion of the cortex, of a kind that delays the onset of fatigue in muscle, clinical evidence suggests that there is normally also some interrelationship between the cortex and the gonads, since there are now in the literature numerous cases in which autopsy has shown that hypersecretion of the cortex is accompanied by marked disturbance of gonadal function.

Falta (1916, 1927) differentiates between two groups of cortical tumours, the one including sarcomata, lympho-sarcomata, carcinomata, cysts, etc., which give rise only to the ordinary symptoms of benign or malignant tumours, while the other includes numerous cases of adenomata or adenocarcinomata. Such adenomata may involve a simple hyperplasia without symptoms or with simply local manifestations, or may assume malignant character and then show great inclination to the formation of metastases. Falta points out that there may be great diversity in the point of departure, which may be from the cortex itself or from separate germs of the cortical system in the kidney or the genitalia. Many, but not all, of such tumours are associated with hyperfunction of the cortex, the resulting clinical picture differing according to the sex of the individual, and the age of development. By far the greater proportion of cases involving hyperfunction occurs in females. In the young child, development of such tumours lead to a markedly accelerated bodily development, with accelerated ossification and dentition, and precocious development of the genitalia and secondary sex characters. In girls, menstruation may occur early. Adiposity is common in both sexes. In the adolescent or mature female the presence of such hyperfunctioning tumours is characterized by an extraordinary influence on the sex characters, there being suppression of menses, marked development of hair of masculine distribution, and frequently enlargement of the clitoris; obesity is common. The voice may deepen, or may remain feminine. Jump differentiates between virilismus and hirsutismus, considering that the first exemplifies the development of maleness in the female, while in the latter there is retention of feminine characteristics. The distinction is obviously merely one of degree. Pseudohermaphroditism has also been associated with cortical tumours. The development of masculinity in the adult or adolescent woman through cortical hypersecretion seems at first sight to be in agreement with the old theory that suppression of the internal secretion of the ovaries leads to manifestation of underlying male characteris-

tics; it is less easily reconciled with more modern theories, according to which the secondary sex characters are true mirrors of the actions of the internal secretions of the male and female gonads respectively. It must be concluded that the effect of a hypersecretion of the adrenal cortex on the ovaries is more profound than a mere suppression of endocrine function.

DR. CHAS. HUNTER.—We have here, then, an *adrenal carcinoma* which not only gives rise to metastases in the lungs and pelvis, but also produces a *hyperfunction of the cortex*, as evidenced by the marked disturbance of sex characteristics and function. This has been proved in a few cases by the successful removal of such adrenal tumours before metastases occurred. Thus Gordon Holmes records that following removal of an adrenal cortical tumour (considered benign) in a woman of 26, menstruation reappeared, the excessive growth of hair of masculine type disappeared, and the clitoris became smaller within a short time (an improvement which persisted for 9 years), while Murray and Simpson have had an equally striking result, following the removal of a hypernephroma in a woman of 36. In the literature, too, are many cases of virilism associated with adrenal cortical tumours, which are evidently malignant, as proved by metastases in various organs. Such association of tumour with excessive function of the affected secretory gland is no isolated phenomenon of the adrenal; some 9 cases of parathyroid tumour associated with evidence of hyperfunction have been benefited by operation; from Toronto and St. Louis are reported cases of hyperfunctioning pancreas permanently relieved by resecting adenomata of the islets, while Wilder reports a case of carcinoma of the pancreas, with hyperinsulinism, the carcinomatous cells affording alcoholic extracts which acted like insulin when injected into rabbits.

The present case presents also *high blood pressure and renal involvement.* One is not surprised that *medullary* adrenal tumours should be reported with paroxysmal or permanent hypertension, or even that the successful removal of such tumours, as in Pincoff's and in Mayo's cases, should be followed by the complete disappearance of symptoms, but that *cortical* adrenal tumours should be repeatedly associated with high blood pressure, and sometimes with evidence of renal involvement, even in young subjects, was an enigma. Volhard records two cases of hypernephroma associated with "the clinical picture of diffuse, hypertonic nephritis with albuminuria and high blood pressure", both symptoms disappearing when the affected kidneys together with the tumours were removed. The recent success of Swingle and Pfiffner's cortical hormone in Addison's disease, involving a rise of the very low blood pressure present, will explain possibly the hitherto mysterious association of some cortical adrenal growths with high blood pressure. Volhard however, in a very recent case has shown that after successful operation the blood pressure may not return to normal; Murray and Simpson, too, found six months after the successful operation that the blood pressure, though often normal, readily went up to its previous height from trivial causes.

The high colour of the patient's face and limbs, and to a less extent of the body generally, has been repeatedly noted in similar cases, and may at times be explained by an accompanying polycythæmia; certainly, even with metastases and renal complications there is no cachexia, as might be expected. A rise of the basal metabolic rate has been noted in some cases and attributed to mild hyperthyroidism, with which, also, the raised pulse rate often present (and seen in this case) is associated.

No satisfactory explanation can be given for the association of *diabetes mellitus* in this case. Achard, Parkes Weber and Hurst Brown, have described a "diabetes of bearded women", in which masculine type of hair, disturbed genital functions, obesity (usually of the trunk, the limbs being comparatively thin), high blood pressure, striæ atrophicæ and glycosuria (all symptoms shown in the present case) are associated, not with a tumour of the adrenal cortex but with slight pluri-glandular changes. Some cases of medullary adrenal tumour have also been described with glycosuria and even diabetes; Moore has recorded a case of diabetes, refractory to insulin, associated with adenomata of the adrenal cortex and with little change in the pancreas, but the co-existence of cortical adrenal tumour with diabetes mellitus must be exceedingly rare. In the present case, 8 units of insulin are required daily to keep the urine free from sugar, on a diet of 60 grams of protein, 140 of fat and 85 of carbohydrate.

Case Reports

INTUSSUSCEPTION OF THE APPENDIX

BY E. W. MITCHELL, M.B., F.A.C.S.,
Toronto

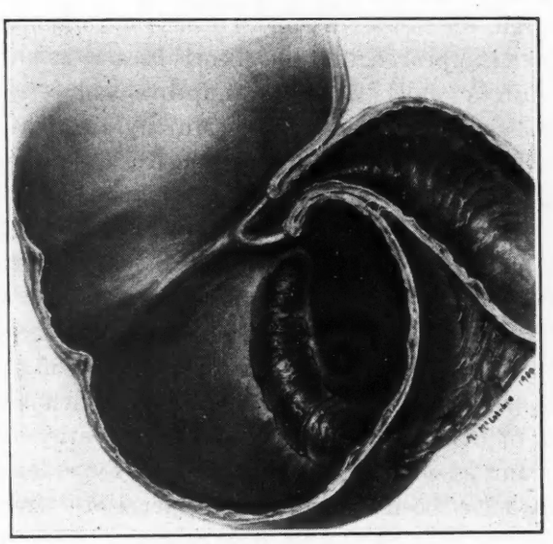
During March, 1930, we had the opportunity to observe and operate on the following interesting case.

Mrs. P., married, aged 28, was admitted to the Toronto General Hospital on March 28, 1931. She had had no illness of importance, and there was no history of a previous attack of appendicitis. She was enjoying her usual health until about 6 p.m. March 24, 1930, when, while at work, she began to have dull epigastric pain. During the night the pain became more severe, spasmodic and colicky in nature, and was referred to the region of the umbilicus. The paroxysms of pain occurred about every two hours, were short in duration, and agonizing. After the paroxysm of pain she felt absolutely well. There was no vomiting and she had a normal bowel movement.

She continued at her occupation for 3 days following the onset. During this period the paroxysms of pain continued, were definitely colicky, referred across the abdomen at the level of the umbilicus, and recurred about every two hours. Bowel movements were normal and there was no vomiting. She consulted me on March 27th, 72 hours after the onset of her illness.

Physical examination.—The patient was a well developed, well nourished adult; the mucous membranes appeared to be normal, and she did not appear ill. The abdomen was scaphoid. There were no visible peristalsis or masses. There was tenderness, without any definite rigidity, on the right side from McBurney's point to the costal margin. There were no tenderness in the right loin and no palpable masses. Rectal examination was negative. The temperature and pulse were normal; white blood count 7600; urinalysis, negative for sugar and albumin; microscopically, there were a few pus cells. She did not return to work the next day; the pain was the same character, probably more severe, and the paroxysms lasted a little longer. She was admitted to the hospital about 8 p.m. on March 28, 1930. On admission, temperature and pulse were normal, white blood count 7200, the urine showed a few pus cells microscopically. There was still tenderness over the cæcum and colon without rigidity; no palpable masses. The pain was more severe during the night following admission, the paroxysms occurring more frequently; the tenderness was more marked; the temperature 99.2°. A diagnosis of appendicitis was made and operation advised.

Operation.—Gas-oxygen and local anæsthesia were employed. The abdomen was opened through a gridiron incision. The appendix could not be visualized, but at the junction of the tænia coli a depression could be seen into which the meso-appendix was traced. (See Fig.) The appendix was felt as an elongated



Intussusception of the appendix

mass within the cæcum. An attempt to reduce the intussuscepted appendix failed. The cæcum was opened through and parallel to one of the longitudinal bands, the appendix was clamped at the base, ligated and removed. The opening in the cæcum was closed, the wound was closed in layers, without drainage. The convalescence was uneventful, the wound healing by primary union.

The *pathological report* (by Dr. W. L. Robinson), was as follows: Subacute and chronic appendicitis (intussusception of the appendix). "The gross specimen consists of an appendix measuring 5.5 cm. in length. It is turned completely inside out; the external surface being

made up of a brilliantly red congested mucosa. This is somewhat fragmented in several areas. On section the appendix presents a central core of mesenteric fat and shows from within out, muscle, œdematous submucosa, and thickened mucosa. Microscopically, sections show a central core of fat tissue; the serosa is thickened, owing to the presence of relatively young fibrous tissue, which is diffusely infiltrated with a considerable number of lymphocytes. The muscle coat is œdematous and infiltrated with a moderate number of œsinophiles. The submucosa is fibrous in character and congested. The fragmented mucosa is markedly congested. There is no evidence of true ulceration present."

A study of the literature shows that intussusception of the appendix is rare. At Mount Sinai Hospital, New York, in 5,000 operations for appendicitis, one case of intussusception of the appendix occurred, as reported by Moschowitz.[1] We have been able to collect reports from the literature on 70 cases, a few of which were probably not true intussusception.

Moschcowitz, in reviewing the surgical pathology of the condition, draws attention to the various ways in which the appendix may be involved. He mentions five ways. Szenes[2] gives practically the same classification. (1) Massive intussusception of the bowel, beginning as an ileo-cæcal ilio-iliac, or ileo-colic intussusception. The normal relationships of the appendix and cæcum are, however, not disturbed in these cases and, therefore, there is no inversion of the appendix. (2) The tip of the appendix may be invaginated into its lumen. This most probably never happens, and we are not able to find a report of any case showing this occurrence. (3) The inversion of the appendix begins at the junction of the cæcum and appendix. This proceeds until the progress is halted by œdema or adhesions. The picture is then one of incomplete inversion. The tip or a considerable portion of the appendix is still visible outside the cæcum. Many of the cases reported in the literature have been of this type, really only partial inversion. (4) If the process of invagination is not halted, but progresses until the appendix is turned completely inside out, we have a complete inversion. No vestige of the appendix is visible. A dimple at the junction of the tenæ coli indicates the point of intussusception. The appendix can be felt within the cæcum. Nine cases of this type have been reported in the literature. (5) The partial or incomplete inversion of the appendix may act as an irritant; the intestine in its attempt to expel it starts an intussusception of the bowel which progresses. This is, apparently, just a later stage of the third and fourth class. Many of these cases of massive intussusception began as complete or partial inversion of the appendix, but owing to failure to diagnose, or delay in surgical treatment, have progressed. By far the largest number of cases reported belong to this class.

ETIOLOGY

The etiology of this unusual condition has never been satisfactorily determined. McKidd,[3] in reporting the first of these cases, noted the presence of pinworms in the child's bowel and thought this might be the cause. Dodds-Parker[4] found an ascaris in the rectum, and suggested this as an etiological factor. Hohmeier[5] had a similar experience and leaned to the same opinion. Battle and Corner,[6] in a study of 30 cases, noted that the age incidence precluded the possibility of appendicitis as an etiological factor. Choyce[7] thinks that an attempt on the part of the appendix to expel a concretion or foreign body may be the cause. This appears to be the most reasonable.

We can safely say that the condition is most frequent in the first decade. The average age of the reported cases was 6.5. There are, however, exceptions to this, as Fruchaud-Brin's[8] case was 69 years; Hassler's[9] 42 years; Huddy's[10] 38 years. Our own case was 28 years old.

Clubb, of Australia, and Erdman, of New York, in a study of intestinal intussusception, noted that the condition was much more prevalent among Anglo-Saxons. The early reports of intussusception of the appendix were largely by British and American surgeons, and we got the impression from these early reports that it was distinctly more prevalent among this race. During the past 10 years larger numbers have been reported by foreign surgeons, so that this preponderance has been changed. Of the 70 cases reported less than two-thirds have been in Anglo-Saxons.

CLINICAL PICTURE

In complete or partial intussusception of the appendix, the pain is characteristic. There is no other condition which gives rise to

precisely the same history of pain. This can best be described as spasmodic and colicky in character. The paroxysms last from one-half to one minute, followed by a remission of from two to several hours. During this period of remission the patient feels perfectly well, but during the spasms of pain is in agony. Vomiting does not usually occur. Reported cases show that vomiting was absent, except in cases which were complicated. Watson[11] mentions that his patient vomited, but here again the case was complicated by a slight ileo-cæcal intussusception.

Tenderness slight or marked may be present. It is located in the right iliac fossa and over the cæcum. In our case there was tenderness without rigidity over the cæcum and ascending colon. Rigidity has been reported in some cases, as in Johnston's,[12] but this was an incomplete intussusception, which showed inflammatory infiltration in the tip and meso-appendix. Rigidity[10] is not likely to be present in most of the uncomplicated cases. I can find no report of a palpable tumour in uncomplicated cases of intussusception of the appendix. The presence of a tumour, felt even after the administration of an anæsthetic to overcome muscular rigidity, should make one suspect something more. The sausage-shaped tumour of the ileo-colic intussusception should make one suspicious of an associated intussusception of the appendix. There is no obstruction in simple invagination. The bowels move normally. There is no evidence of gross blood or mucus in the stool. In most cases there is no history of constipation, daily movements being the rule. The whole clinical picture may be changed, owing to the onset of intussusception of the bowel with obstruction, and the symptoms of bowel obstruction may mask completely the earlier and less serious symptoms of appendiceal intussusception.

DIAGNOSIS

Few of these cases are correctly diagnosed, probably because they are rare and are not ordinarily considered in a differential diagnosis. Fortunately for all, the condition runs a chronic course, as is evidenced by a case of Brewer,[13] of New York. His patient had been operated on five months previously for appendicitis; the surgeon could not find the appendix and closed the abdomen. The symptoms persisted and Brewer operated on her, removing a completely intussuscepted appendix. This relieved her symptoms.

Pain is probably the most reliable symptom. It is characteristic, colicky, short and sharp, with definite remissions, during which time the patient is as well as usual. The paroxysms vary in frequency from two to several during the day. The whole clinical picture is less severe than in bowel obstruction and not often does the patient vomit. There are not the rigidity and increased leucocyte count found in acute appendicitis. The early recognition and appropriate treatment of these cases would reduce the mortality and the morbidity. The more serious complication of intussusception of the bowel would be eliminated.

TREATMENT

In the incomplete type of intussusception of the appendix, it may be possible, in a certain number of cases, to reduce the intussusception by manipulation, and do an appendectomy. In many cases reduction will be impossible by manipulation and an incision of the cæcum, with reduction and appendectomy, or excision with the adjoining part of the cæcum will be necessary. From our personal experience we do not believe that it would be possible to reduce a complete intussuscepted appendix by any method of manipulation. In that type of case the cæcum should be either, (1) incised with removal of appendix from within, or (2) the appendix excised with resection of a small cæcal collar surrounding it. The condition, when diagnosed or suspected, should receive surgical treatment. It hardly seems possible that any other treatment, such as insufflation with air and water, would succeed. The early recognition and proper treatment of these cases will alleviate the danger of massive intussusception of the bowel and its more serious consequences.

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FALSE ANEURISM OF THE ABDOMINAL AORTA

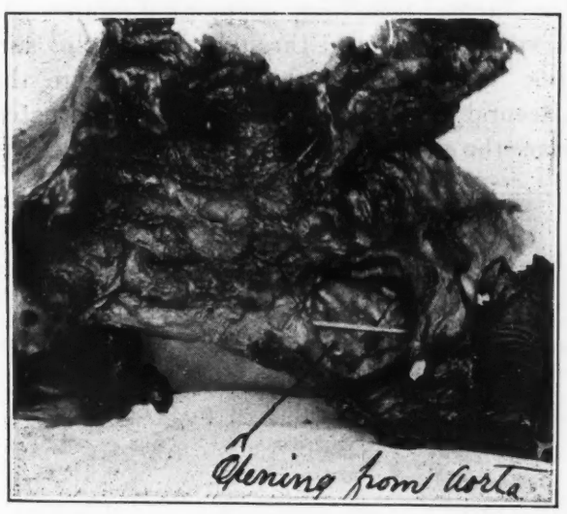
BY W. A. LINCOLN, M.D., F.R.C.S. (ENG.),

Calgary

F. B., white, male, aged 42, single, was referred to me by Dr. H. W. Soby, of High River.

Personal history.—He had had syphilis about twelve years ago, for which he received some treatment, and never developed any active lesions. He had had good health until nine months ago, when he began to have vague abdominal discomfort, gas, and indigestion, for which no definite diagnosis could be made.

History of illness.—About two months ago, while pitching hay, he developed very severe pain in the left side of the abdomen, running down his leg, and went into collapse for a few hours. Examination at this time did not reveal any abnormality of the abdomen or left flank, and no definite diagnosis could be made. About a month later he developed a mass in his left flank, which increased in size until it filled the whole left side of the abdomen, protruding noticeably in the flank and a little behind. This extended up over the ribs and down to Poupart's



ligament. It had a decided cystic feeling and gave an expansile pulsation. There was no bruit or thrill. Pulsation was present in the tibialis, posterior tibial region, and there was no swelling or discoloration of the leg.

The Wassermann reaction was positive; blood examination, practically normal. A pyelogram of the left kidney was normal, although the kidney was displaced forwards and upwards. A barium enema showed the colon to be normal and running over the top of the mass. X-ray showed some erosion of first three lumbar vertebræ. He ran a slight temperature, suffered severely from a boring pain, and failed rather rapidly, dying from exhaustion in about four months after onset of the severe pain.

Autopsy.—The post-mortem examination revealed a large sac, practically filling the whole left side of the abdomen, with the colon lying over the top of it, and the kidney pushed up in front and above. The anterior and inner walls were very thick, while the outer and posterior walls were formed by the body structures. It contained nearly three quarts of clotted blood and a great deal of laminated clot. There was erosion of the bodies of the first, second and third lumbar vertebræ. The opening from the aorta was clear-cut, measuring 1½ inches across and came off from the aorta behind and slightly above the left renal artery. Sections of the aorta in this region showed slight fibrosis, but the remainder of the vessel was comparatively healthy.

COMMENT

These cases are not very common and, therefore, I thought this worth reporting. Out of 19,300 autopsies in Vienna, the condition occurred but 3 times, and in 18,000 autopsies at Guy's Hospital in London, there were 54 cases.

By far the most common situation for these aneurisms is in the region of the cæliac axis artery. It has also been shown that this is the site of election for sclerotic processes in the aorta. Rupture into the retroperitoneal region is common, as in this case, where a huge mass may develop with its consequent erosion of the spine or other structures. Death usually occurs in from a few months to a year from the date of rupture. Diagnosis is impossible in the early stages and, in the later stages, the condition may be taken for sarcoma, hydronephrosis, pancreatic cysts, etc. Definite expansile pulsation, or x-ray demonstration of erosion of the spine, is fairly conclusive evidence. No known treatment is of any avail.

PLACENTA INCRETA

BY P. J. KEARNS, M.Sc., M.D.,
Royal Victoria Montreal Maternity Hospital, Montreal

Before discussing the abnormal relationship of the placenta to the uterine structures as is seen in adherent placenta and placenta increta, one must clearly define the anatomical position of the placenta at different age periods of its growth and also the normal mechanism of placental separation. In pregnancy the tissues are arranged in the following order; uterine muscle, spongiosa, decidua compacta, and placental villi. This order persists throughout pregnancy and it is the tissue changes in the spongiosa which allow for various expressions of placental separation.

The normal separation of the placenta is facilitated by a rapid diminution of intra-uterine pressure following upon the escape of amniotic fluid and expulsion of the fetus, with consequent dilatation of already senile degenerated sinuses in the uterine wall below the placenta and in the spongiosa. The subsequent contraction of uterine muscle increases the mechanical fluid pressure and a retro-decidual hæmorrhage spreads along throughout the spongiosa and separation results with the decidua compacta adherent to the placental villi.

Before the fifth month, owing to less sudden diminution in intra-uterine pressure, and since the vessels in the spongiosa are younger and surrounded by much inter-glandular decidua, the mechanical stress of the fluid within the endothelial lined spaces of the spongiosa fails to produce a continuous retro-decidual hæmorrhage and incomplete abortion of the placenta follows. This incomplete separation of the placenta must be clearly differentiated from the adherent and increta forms of placenta which are also retained *in utero*. If the ovum is implanted upon a poorly formed mucosa, upon a mucosa which is stretched and atrophied over a submucous myoma, or, close by a Cæsarean section scar, a deficient decidua compacta and spongiosa may form, resulting in an adherent placenta. Following upon a pyometra (Frankl[1]), or in the case of maldevelopment of the uterus, hypoplastic endometrium, or marked degenerative or atrophy changes, no true decidua compacta or spongiosa forms and chorionic cells, later, chorionic villi, wander deeply into the muscle, digesting and separating off muscle bundles, as is seen in tubal pregnancy. This relationship of the placenta to uterine muscle is called placenta increta and differs from the adherent forms in that it cannot be removed manually.

CASE REPORT

Mrs. C., aged 30, 2-para. Menstrual history, 18 x 4 x 3.

The patient was admitted to the Royal Victoria Montreal Maternity Hospital as a primipara on January 2, 1928. She was delivered normally on January 3, 1928, the placenta being expressed within twenty minutes of the birth of the child. Delivery was followed by a severe puerperal sepsis. On November 30, 1930, the patient was again admitted to the obstetrical ward at term. Delivery was spontaneous, but the placenta was retained. Manual removal was attempted but was unsuccessful. A blood transfusion was given, followed by a subtotal hysterectomy.

The specimens received at the laboratory consisted of a placenta and uterus. The placenta measured 25 cm. by 18 cm., was thin, fragmentary, and had a lobus succenturiata. The uterus had been amputated above the cervix and sectioned through the anterior surface. The wall of the uterus opposite the placental site was 4 cm. in thickness. Situated near the left cornu was a portion of the

Low power microphotograph of section taken through the retained placenta and underlying muscle.

placenta, 4½ cm. in depth, and firmly attached to the surface of the underlying muscle. The decidua vera was thin and poorly developed throughout.

Microscopic study of sections taken through the portion of placenta and underlying muscle showed that no definite decidua compacta or spongiosa had formed. The chorionic villi had grown into, separated off, and digested the muscle bundles. In areas a decidual change had occurred in the sheaths of the muscle bundles. A section taken through the decidua vera opposite the placenta showed a thin layer of decidua, but no true spongiosa.

DISCUSSION

The absence of decidua compacta and spongiosa in this case, and the invasion of the muscle by placental villi, permits the diagnosis of placenta increta, a condition more rare than placenta adherenta or placenta accreta.

In our case the destruction of the endometrium by the puerperal sepsis following the first pregnancy is borne out by the fact that during the first labour the placenta separated normally.

In 1928, Klaften collected 45 cases of placenta increta, and in 1929 Joachimovitz rounded this number out to 70, as is mentioned in a recent article by Kwartin and Adler.[2]

I am indebted to Mr. W. J. Plumpton for the technical study of this case.

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A CASE OF MALDEVELOPMENT OF THE UTERUS

BY HAROLD MORISON, M.D.,

Dryden, Ont.

Mrs. H., aged 24, consulted me about the middle of March, 1931,, complaining of a pain in the right lower abdomen. This patient was English by birth, bright intellectually, and in appearance of small stature. Her height was 5 ft., weight 87 lbs., and she appeared much younger than her age. The family history was negative.

The following points in her history are worthy of note: (1) pain in the right lower abdomen of three days' duration; (2) a small mass in the left inguinal region, present, she thought, from birth; (3) she had never menstruated; (4) she had never experienced sexual desire, and since she was married had rarely experienced sexual satisfaction.

The following points were elicited by examination: (1) Marked tenderness over McBurney's point, with considerable rigidity; (2) a mass in the left inguinal region, definitely a left inguinal hernia, with what was apparently omentum adherent in the sac; (3) on vaginal examination it was found that the vagina was a blind pouch; there was no evidence of a cervix, and no uterine body could be palpated.

As the attack of pain commenced three days previously, the patient was advised to wait for two or three weeks, and then enter hospital for removal of the appendix and left inguinal herniotomy.

She was admitted to hospital on April 2nd, and was operated on on April 3rd.

The operative findings were as follows.

On opening the inguinal canal on the left side, a small sac was easily demonstrated. This was separated and cleared down to the internal ring. The sac was then opened and was found to contain, not omentum but a sclerosed ovary, a broad ligament and a uterus the size of a small marble attached to the round ligament. The round ligament was severed, and, on further examination, I found that the uterus and ovary were connected internally to the anterior abdominal wall, with apparently a good blood supply. They were returned to the abdomen and the herniotomy was completed. The appendix was removed through a McBurney incision. On examination through this incision it was found that there was an apparently normal ovary on the right side, with a mature Graafian follicle.

Editorial

THE VANCOUVER MEETING

THE meeting in Vancouver in June, 1931, was the sixty-second from the very first of all, held about the time of Confederation. What tremendous changes six decades of gatherings of the medical men of Canada have seen!—changing phases of medicine, the whole career of modern surgery, changes in personnel, in manners, modes of thought, and certainly in the general topics of conversation that flow genially among the more formal papers and discussions. How did conventions ever get through without the alibi of golf, or the currents and occasional flood tides of post-golfian conversation? What would the charter members of 1867 have found at Vancouver?—the sciences mostly new, the arts of medicine mostly old and familiar, and the spirit we trust, after all, still the spirit of Hippocrates.

Certainly, the sixty-two meetings have been sixty-two varieties—no two alike. Even in the many turns all the larger cities have had, different times, varying subjects of discussion, changing human elements, and ever changing circumstances, even in the same places, have made very different meetings. All of them have been all-Canadian, yet each has been local and sectional also, especially those at geographical extremes. Halifax meetings are necessarily very different from meetings in Montreal or Toronto, Winnipeg or Vancouver. The Vancouver meeting of this year was all-Canadian, and a considerable Gideon's band from the eight provinces came through to the sunset province, in spite of depression, and drought, and stocks, and many other elements of the times we live in. But it was very definitely a British Columbian, indeed a Vancouver, meeting, with Vancouver efficiency, enthusiasm, and success, Vancouver charm, hospitality and atmosphere, and—shall we say it?—Vancouver weather.

Really the damp days Vancouver put on were just an extra touch of hospitality for the parched and dusty members from the arid prairies of this year. Anyway, this beautiful city can carry even a daily drizzle with grace, and, of course, it was "very unusual for June". It must have been, for one prairie delegate who struggled through the wetness in search of a waterproof was told in four stores that such articles, being unseasonable in Vancouver in June, were necessarily out of stock. But damp is good for roses. "It was roses, roses all the way" at Vancouver, a fresh button-hole rosebud awaited each member each morning at the registration centre, and every reception and garden-party was staged in bowers of roses. It is said that eastern golfers resorted to waterproofs.

The ladies' program was unusually attractive and all the social events found a most hospitable host and a most gracious hostess in the president, Dr. Monro, of Vancouver, and his charming lady.

It was a thoroughly good meeting in every way, and by no means the small one that had been feared. In spite of many handicaps there was a total registration of 509 doctors, and something like 300 ladies, besides. British Columbia naturally led, with 328. Ontario and the neighbouring province of Alberta came next with 36 and 33, respectively. Out of the heat and dust of Saskatchewan and Manitoba came 19 and 14; Quebec had 12 representatives, and each of the Maritimes one. Sixty-four were present from the United States, chiefly from the neighbouring states of Washington and Oregon, whose men have a habit of meeting with the British Columbia brethren. At least one province besides British Columbia had one hundred per cent attendance of delegates at council for two full days before the regular meetings.

As a sort of preparation for the bigger event, some delegates attended the Canadian Public Health Association meeting at Regina, and others spent a happy and busy week-end with the Canadian Tuberculosis Association in charming surroundings at the Sanatorium at Tranquille, and were brought by hospitable British Columbian hosts by auto to Vancouver. So varied were the ways of

travel that "*How* did you come?" was the second part of most salutations when friend met friend. No wonder that many were attracted by the remarkable mountain roads of this beautiful western province.

Besides the main meeting there were staged also annual gatherings of the British Columbia Medical Association and the North Pacific Pædiatric Society. Separate sectional meetings were held in Radiology and Urology. Part of an afternoon was devoted to Medical History. Two excellent papers were presented on the early practitioners of the coast by Dr. M. W. Thomas, of Victoria, and on the medical practices of the coast Indians, by Dr. G. E. Darby, of Bella Bella. Standing room only at this meeting augured well for the future of the new section. A military meeting, also an innovation, was well attended.

A very sensible custom in conventions in British Columbia and in the north-western States that occasionally meet with this province is to have them, as much as possible, one-ring shows. The general practitioner is physician and surgeon and specialist, and, with half a dozen tempting sections carrying on at once, as in the bigger meetings, the keen man is sure to be worried by the thought of what he is missing. Apart from two half sessions in Radiology, a full morning in Urology and the short meetings of the Sections of Medical History and Military Medicine all the shows were in the main tent. Here the turns were various, just as the general practitioner likes them, changing from obstetrics to surgery, from surgery to medicine, from medicine to public health, from public health to physiology, from physiology to various special branches, and back again to obstetrics. Of forty-four scientific papers twenty-six were in the main meeting place, the ball-room of the Vancouver Hotel. Attendances at ordinary sessions were from 200 up.

An event of unusual interest for which the Vancouver convention will be remembered in years to come was the first Blackader Oration. This was delivered by Dr. E. A. Park, Pædiatrician-in-chief of the Johns Hopkins Hospital, and was on "Rickets". It was a contribution worthy of the occasion. Nevertheless, it was not so much the brilliant lecturer who was in the thoughts of the eight hundred or more people in attendance as the man in whose honour the foundation was established. A letter from Dr. Blackader, read by the President of the Association, gave the keynote for the evening, and, in a very real way, though absent on account of illness, the good Doctor seemed almost to be present. Several telegrams to Montreal, and kindly replies, made the association very close at this first oration between the Canadian medical men in convention and the man it delights thus to honour.

Another first event for which the Vancouver meeting will be remembered was the presentation of a badge of office for the President. This beautiful decoration of red and gold had been worked out during the past year and presented by Dr. John Ferguson, of Toronto. Dr. Primrose placed it first, at the formal opening meeting, upon the neck of the retiring president, Dr. W. Harvey Smith, who in turn decorated the president of the year, Dr. A. S. Monro, who presided over the many and various meetings with a rare combination of dignity and geniality. At the mature age of sixty-two the Canadian Medical Association is well entitled to a little of the pageantry that graces and becomes the older British Association. A matter that may be worked out at leisure by our authorities on procedure is as to whether the badge of office should be worn only at formal meetings, or at social functions that are on the program as well. We are inclined to think the latter is the British usage.

It was particularly fitting that the meetings should be formally opened by the Premier, Hon. Dr. S. F. Tolmie, whose father came out as surgeon to the Hudson Bay Company at Fort Vancouver in what is now Washington State, in 1833, and whose career there, and later at Victoria, was dealt with at length in Dr. Thomas' paper in the historical section. The Premier, whose training and practice were in veterinary medicine, discussed in humorous vein the differences between the healing arts as practised among human beings and the lower animals. One advantage in the case of the latter was that a cow could not be "buncoed" by spinal adjustments or other such things. Dr. Tolmie gave some particulars of this wonderful province, the Warden of the West Gate of

Canada—23,000,000 acres of land classed as arable; $73,000,000 worth of minerals mined annually; 350,000,000,000 feet of soft wood cut per annum; $82,000,000 income from timber; half of the fish of all Canada; 22,000 miles of roads; and a vast hinterland yet untouched. A welcome in fitting terms was given also by the mayor of Vancouver, who, evidently, in these days of unemployment is a much worried man.

The Vancouver meeting was one to remember. The papers were good in quality and in style. Medical men are coming to prepare papers a little more with the idea of presentation, to use more Anglo-Saxon, and less of the lumbering medical jargon of Latin and Greek; they are beginning to allow themselves occasionally some little sprightliness, and a glint of humour; are beginning to find that a written paper can "go over" one hundred per cent if well read, but perhaps not ten per cent if mumbled into collar and tie with the reader's, perhaps bald head, instead of his more handsome and more expressive facial features presented to the audience. Speakers are beginning also to become microphone-conscious. But the papers can be judged as they appear in the pages of the *Journal*. The public meeting had a remarkable attendance. Something like a thousand people got in, and some hundreds were turned away, and that to hear such subjects as cancer and tuberculosis discussed. The speakers were Dr. Douglas Quick, of New York, the Honorable Dr. Munroe, of Saskatchewan, and Dr. D. A. Stewart, of Ninette. One provincial minister of health attended the sessions, besides Dr. Munroe, the Hon. Dr. E. W. Montgomery, of Manitoba.

Perhaps the most lasting impression for most of the medical visitors to Vancouver will be that of the beauties of Howe Sound as seen on the convention excursion,—all the blues and greens and purples of the palette, in water and on mountains, with an occasional white cap glistening through the haze, and wisps of trailing cloud that revealed rather than concealed the grandeur and beauty of the peaks. And the astounding thing is that this seems literally just one of hundreds, or even thousands, of beautiful places right on the door-step of this charming convention city.

D. A. STEWART.

THE USE AND ABUSE OF NARCOTIC DRUGS

SINCE its inception the League of Nations has shown great and increasing activity in regard to Public Health and Public Welfare. Not the least commendable have been its efforts to investigate and, eventually, to curb, the illegal traffic in habit-forming drugs. Notable progress has been made towards this objective. Last May a committee of experts, consisting of Prof. W. E. Dixon (Cambridge), Prof. Erich von-Knaffl-Lenz (Vienna), Prof. M. Tiffeneau (Paris), and Dr. P. Wolff (Berlin), was appointed, and the Technical Committee of the League submitted the following questions, on which the Committee was asked to report:—

(1) What are the properties of diacetylmorphine (heroin) which render it particularly suitable to serve as a habit-forming drug, and to form a subject for illicit traffic?

(2) What are the therapeutic advantages of heroin as compared with morphine and morphine derivatives?

(3) Are the therapeutic properties of heroin such that it cannot be replaced by other drugs without ill effects on the patient?

(4) Are not the risks of heroin for humanity incomparably greater than the advantages resulting from its therapeutic use?

(5) Can the experts state what is the medical practice in each of the countries possessing a highly developed medical system as regards the use of heroin, and give their opinion as to the value of its use?

(6) Is heroin an indispensable drug?

It is noteworthy that the Committee arrived at an unanimous decision on these several points, and the opinion of such a representative body of experts demands the careful attention of the practising physician in every country. We shall endeavour to give the gist of their report* in a brief form.

*League of Nations. Traffic in Opium and Dangerous Drugs; Expert Report of a Technical Committee on Heroin.

Morphine and its derivatives, whether habit-forming or not, possess certain common properties and characteristics, though in varying degree. The first of these, the relief of pain and the induction of euphoria, pertain only to the habit-forming alkaloids. Being analgæsic and able, in certain people, to alter psychical reflexes so as to produce a feeling of happiness and well-being, such alkaloids readily lead to addiction, and the addict acquires an irresistible craving and gradually increasing tolerance. A second property, that of depressing the respiratory centre, is common also to the habit-forming derivatives of morphine. This effect is exemplified, perhaps best, by the relief of cough and all painful affections of the respiratory system. A third property is the depressant action on the alimentary canal, noted in the production of constipation and the relief of colic. From this point of view the Committee considered and compared the various actions of the morphine group, notably, morphine itself, codein, heroin, dicodid, and dilaudide. The findings, in this connection, are particularly valuable to the medical man.

Taking morphine, the basic drug, as the standard of comparison, we find that it relieves pain well, alleviates cough, and produces constipation. It is strongly euphoric. Codeine (methyl morphine) is analgæsic and euphoric in a much less degree; it has about the same effect on the respiratory tract; and its effect on the alimentary tract is a little less. Heroin relieves pain and cough better than morphine, has little or no action on the alimentary tract and is much more euphoric than morphine. A knowledge of these fundamental actions is essential, as it will enable the physician to prescribe the drug most suitable for the relief of the special indication, thus avoiding undesirable by-effects, and minimizing the danger of addiction. To give an example. To relieve cough codeine is preferable to morphine, as it is here not usually necessary to relieve pain, and a possible dangerous euphoric action is avoided. Also, there is less chance of constipating the patient. For the relief of pain and cough heroin is much better than morphine, and has the additional advantage that it is not constipating. Yet, in the opinion of the Committee these advantages are more than counterbalanced by the disadvantages. The answers of the Committee to the specific questions will be of interest and assistance, even if given in epitome. They say—

(1) Heroin is more powerful than morphine; therefore, the dose is smaller and trafficking in the drug is easier. Unlike morphine, heroin can be taken as a snuff, and may even be smoked.

(2) Heroin is twice as effective as morphine for the relief of pain. It is more effective than morphine or codeine for the relief of cough; it does not constipate.

(3) Heroin, though a popular drug with physicians, can in most, if not all, cases be efficiently replaced by other derivatives of morphine. For cough, though not so powerful as heroin, codeine is a valuable substitute. Dicodid has as powerful an effect on the respiratory system as morphine, though less powerful than heroin. It is much less likely to cause addiction than the other two drugs mentioned. For the relief of pain, when it is considered undesirable to act on the bowels, heroin is better than morphine, but dilaudide offers equal advantages. The euphoric effects of dilaudide are less than those of either morphine or heroin, as gauged by the withdrawal phenomena.

(4) The dangerous nature of heroin, from the social point of view, overshadows its therapeutic importance. Its habit-forming properties transcend those of any other member of the habit-forming narcotics. "The effect of heroin is in the main to produce a change in personality, as shown by an utter disregard for the conventions and the morals of civilization. The disease progresses more rapidly than with any other habit-forming narcotic drug; all the higher faculties of mind, such as judgment, self-control, and attention, are weakened, and such people rapidly become mental and moral degenerates. The heroin habit is the most difficult of all to cure; sudden withdrawal of the alkaloid which, according to most authorities, is the best treatment for the morphine habit, may lead to cramps and convulsions, and even to death from respiratory failure. But besides the difficulty of withdrawal, the after-convalescent treatment, both psychical and physical, is longer

and more difficult with heroin, and relapse is the rule."

(5) Medical opinion as to the therapeutical value of heroin varies not only in different countries but even in the same country. It is suggested that this peculiarity may be attributed to fashion. A large majority of the eminent pharmacologists and physicians in Europe and America are definitely opposed to the employment of heroin in medical practice.

(6) In view of the evidence available, heroin can be entirely dispensed with.

These are weighty statements, worthy of careful consideration. In the light of the findings of the Committee more attention might perhaps be given by practising physicians to the newer drugs, dicodid and dilaudide. In regard to the latter Professors Dixon and Tiffeneau desire to state that they have had no personal experience with it. Apparently, however, as the report of the Committee is unanimous, these gentlemen are satisfied with the evidence adduced in its favour. It is clear that heroin as a therapeutic agent has outstanding merits, but it has also the dangers of those merits. Why not do without it? A.G.N.

THE LEPROSY PROBLEM

TO the wide-ranging eye of the League of Nations leprosy is still one of the major infectious diseases, however rare it may now be in the western hemisphere and Europe in general. We are told that there are some four million lepers in the world, several thousands of whom are in Europe. The majority are in Asia, the East Indies, Oceania, Africa, and South America, and the disease seems to be showing a marked tendency to spread in many of these countries.

To deal with the problem, the League of Nations through its Health Organization, set up a Leprosy Commission, composed of heads of important health administrations and specialists in leprosy, and their report is now available.* It is pointed out that the prophylaxis of leprosy is only just beginning in some countries, and the need for organized efforts to deal with it is very great. At the same time, no one measure will solve the problem. The difficulties to be contended with vary with the geographical, economic, administrative and financial conditions of the countries in which the disease exists. It is therefore felt that it will be better to take up only the most urgent questions upon which prophylaxis depends. Active treatment is the most important line of attack. Where this is not yet possible, segregation is the only other efficacious course. This can be made less rigorous as treatment becomes available.

As regards treatment, it became clear from the exhaustive discussions of the commission that there were two distinct opinions, one of which laid far more stress than the other upon the value of special treatment. Both schools of thought, however, agreed that general and dietetic treatment were essential, a diet rich in vitamins being insisted on as a necessity. The chief special method of treatment consists in the use of chaulmoogra oil and its derivatives, although supplementary measures such as protein shock, metallotherapy, applications of dioxide snow and trichloracetic acid, and radiotherapy may all be used with advantage. There is as yet no unanimity as to the specificity of chaulmoogra oil. This remedy is admittedly highly efficient, but it is not a specific, and some leprologists hold that its beneficial results depend on the coincident employment of the general measures referred to. No experimental comparison has as yet been made between the effects of each of these lines of treatment. Even the technique of administering the oil is not universally agreed on, nor yet the best method of preparing it. The consensus of the commission, however, was that the intradermal injection of the ethyl esters of the fatty acids of the chaulmoogra oils is the most effective method at present available.

The discussion on methods of isolation showed how ineffective this measure is in itself, tending as it does to promote concealment. Isolation of infectious lepers on a

*The Principles of the Prophylaxis of Leprosy. League of Nations Publications, 1931, 3: 2.

proper basis, however, is one of the essential measures in the control of the disease. It should be accompanied not only with active treatment but with educational propaganda, both amongst the public and the patients themselves. It should depend upon the distinction between infectious and non-infectious cases, the best method for making this being the bacteriological examination.

It is evident, then, that much has yet to be done to unify the methods of dealing with the disease from the strictly therapeutic point of view. But much more work, and probably a great deal more time, will be required for the general organization necessary to carry on the prophylaxis. Legislation must be framed to readjust the older methods based largely on police control; notification must be made compulsory; facilities for treatment must be enormously increased; a form of census of lepers must be undertaken; and in many countries public opinion is in need of constant education to overcome what is now a wavering between indifference and panic.

These are but a few of the points dealt with, clearly and in some detail, by the report. It is, of course, only the preliminary spadework, but like so much of the work of the League it represents earnest and painstaking labours on an international scale, and should be followed with interest and sympathy in every country.

H.E.M.

Editorial Comments

Chrysanthemum Dermatitis

It is well known that contact with certain plants will cause poisoning, in the form of itchiness, pain, and various grades of local inflammation. The nettle and the various species of Rhus are competent to produce these phenomena in most, if not all, persons who touch them; the primula affects only those with a special idiosyncrasy. It is, perhaps, not generally known that certain kinds of chrysanthemum also are competent to produce toxic manifestations in susceptible people. Mr. G. S. Nightingale, M.R.C.S., has just reported a case in *The Lancet* (1931, **1**: 1132). His patient was a market gardener, who for twenty-five years had noticed, when he handled chrysanthemums, outcrops of pin-head vesicles on the backs of his hands and wrists, and a form of eczema on his left forearm at the point where the plants rested when he carried them. Each year in October similar eruptions occurred, the attacks becoming worse each successive season. At first only some varieties of chrysanthemum affected him, notably those with the strongest smell, but, eventually all varieties produced the same effect, and, finally, even the handling of the roots was sufficient to bring on an attack. On admission to hospital the patient presented sheets of dry, scaly, lichenised papular erythema on his hands and forearms, with a few scattered relics of small furuncles. His legs were erythematous and excoriated on both shins.

It is probable that various factors enter into the causation of plant dermatitis. Nightingale quotes Smith[1] to the effect that "any rough surface or prickles may abrade a delicate skin, and almost any cell-sap may act as an irritant." There is some evidence for thinking that the small hairs on the stems of certain plants may be irritating to certain skins, but this is not invariably the case; the essential oils contained in the leaves, stems, and roots are more often the determining factor. For example, Broers[2] says that *Chrysanthemum vulgare* gives out a brownish oil which consists of one of the terpenes or an isomeric modification of camphor, which has been used as an abortifacient, and Lewin is said to have once seen a pustular rash caused by this oil. Various species of *Pyrethrum* and *Chrysanthemum* are used in the manufacture of insecticide powders, and workers in these sometimes suffer from dermatitis. The condition is only found in persons presenting a special idiosyncrasy. This is proved by a simple test, which is also diagnostic. Strap a chrysanthemum leaf to the upper arm, with some other leaf, known to be innocuous, such as a tulip leaf, as a control. Do the same to some other persons, who give no history of being susceptible to chrysanthemum poisoning. After twenty-four hours, the susceptible person will have developed a marked erythema, perhaps with vesication, while there is only a slightly noticeable erythema at the point where the control leaf was applied. The normal, control, persons will be unaffected. A similar test might, no doubt, be adapted to the case of those who are susceptible to the poisonous action of other plants. The diagnosis can be readily made in this way, and may be important, not only in

1. Smith, *J. Bot.*, 1929, **60**: 131, 175.

2. Broers, Die Schädigungen der Haut, Oppenheim and Rille, Leipzig, **2**: 524.

the matter of treatment, but in connection with compensation. A history of contact with one or other of the several plants referred to is, of course, highly suggestive. A.G.N.

Disseminated Sclerosis

The interest in the claim of Miss K. Chevassut that she had demonstrated a spherule in disseminated sclerosis, which was followed by her refusal of an offer of the Medical Research Council to afford her the opportunity of demonstrating the spherule in another London laboratory and Sir James Purves-Stewart's consequent dissociation from further collaboration with her, has been revived by the declaration of Dr. John A. Braxton Hicks and Mr. F. D. M. Hocking that, working independently of Miss Chevassut, they have repeatedly observed a spherule in spinal fluids from disseminated sclerosis patients. This they are ready to demonstrate to any interested colleague. They do not claim that the spherule is to be found only in disseminated sclerosis, nor are they ready to express an opinion as to whether the spherule will prove to be a living virus or due to some biochemical precipitation. They are continuing their research and hope to publish their observations in due course. W.H.H.

The Late Baron Shibasaburo Kitasato

The passing of Baron Kitasato means the loss of one of the last, if not the very last, of that small coterie of research workers who laid so well the foundations of bacteriology and its daughter science, immunology. To those who studied these subjects in the early "nineties" the names of Pasteur, Koch, Behring, Roux, and Kitasato are familiar words. Kitasato brought the new learning from Europe to Asia and perhaps more than anyone else started his countrymen on that pursuit of scientific medicine in which they have become so highly distinguished.

In 1885 Kitasato was sent to Europe by the Japanese Government to study bacteriology and infectious diseases. At that time Robert Koch was rapidly approaching the zenith of his fame and his laboratory was drawing eager students from all parts of the world. Accordingly, Kitasato repaired to the Hygienisches Institut at Berlin, where he remained six years. After acquiring the rigorous technique of his master, he began to study the organisms of cholera, typhoid fever and anthrax and published a number of researches. He first attained distinction when he announced that he had been able to cultivate the bacillus of lock-jaw in a pure state. As a result of his studies he realized, and he was the first to do so, that tetanus is essentially a disease of intoxication, and this view was confirmed when Knud Faber discovered the tetanotoxin in 1890. On December 4, 1890, appeared an epoch-making paper in the *Deutsche medizinische Wochenschrift,* by Behring and Kitasato, which established for the *B. tetani* three fundamental facts—that the bacillus produced a soluble toxin; that animals injected with this substance developed a neutralizing substance, hence called "antitoxin"; and that this antitoxin is specific. One week later Behring announced the same conclusions for diphtheria. The science of immunology had been born.

Returning to Japan in 1891, Kitasato established a private bacteriological institute at Shirokane, across the bay from Tokio, which was first subsidised by the Japanese Government and then taken over by it as The Imperial Japanese Institute for Infectious Diseases. From this school came an eminent band of pupils, amongst whom may be specially mentioned Aoyama, Kioshyi Shiga, and S. Hata.

Kitasato's most notable feat was his discovery of the cause of bubonic plague. In 1894 plague was devastating the East, and when it reached Hong Kong, Kitasato and Aoyama went to investigate it. Landing on June 12th, in two days Kitasato had seen the causal microorganism in films, news of the discovery being cabled to Koch. Koch asked him if he had been able to cultivate the organism, and in a few days more Kitasato had the answer to this question, being able to report success. Within a week of the arrival of the Japanese band Yersin arrived at Hong Kong and independently discovered what we now know as *B. pestis.* The discovery of this microorganism was, perhaps, Kitasato's crowning achievement. The first publication in English of his work on plague appeared in *The Lancet* (1894, **2**: 428). From this time on Kitasato was recognized as one of the world's leading savants in connection with bacteriology and infectious disease. In 1915 he left the Government service and established his own laboratories in Tokio where he has worked since. Here, too, he was eminently successful. For his services to science and humanity Kitasato was created a Baron of the Japanese Empire in 1924. He died on June 13, 1931. A.G.N.

Special Articles

THE DOCTOR AS THE LAWYER SEES HIM*

BY ALBERT E. POWELL, *Barrister-at-law, Cleveland, Ohio*

The lawyer looks upon the doctor from a different angle and in different moods than the ordinary man. This, in part, is due to the fact that the lawyer and the doctor, as professional men, are separated from and given a measure of kinship by the great body of people that we call "laymen", and as between themselves there is, at times, a community of interest or antagonism more or less friendly, which gives hue to the thought, one of the other. Of professional men, these two probably come the closest to the individual in the ordinary walk of life and, of the two, the doctor is the closer. Both deal in a general way with the same quantity, but in different aspects.

The doctor is concerned with that wonderful laboratory known as the human body, its metabolism, preservation and restoration. The lawyer is concerned with the problems of the man proper, occupying that body, and his rights and wrongs. The doctor comes so close to his subject that there are practically no secrets from him, except what nature herself withholds. Indeed life itself is not essential to his understanding as his anatomical studies exemplify the truth of the old proverb: "Dead men open the eyes of the living." He has the advantage that he deals with a stable subject—the human body, which has been substantially unchanged in structure for centuries. He has also certain specifics, few in number indeed, but while physiology and chemistry endure they remain specifics.

The lawyer, on the contrary, deals with qualities which are in the main unstable because, while certain features are regarded as fundamental, they are thus by recognition and usage and do not rest on any absolutely fixed relationship, which may be said to be the basis of science. Some specifics, statutory or otherwise, exist, but they can be changed or eliminated by a more or less inspired legislative body. But, dealing intimately with bodies and rights of men, there is a kinship and the family doctor and the family lawyer have much in common. This is evidenced by the humorous attitude sometimes assumed toward both by the public. Again there is a difference, since the humour, as to the lawyer, usually deals with his lack of veracity or moral delinquencies in the acquisition of his client's pelf whereas the jokes about doctors usually relate to lack of skill. What appears to be the only joke in the Bible deals with them where, in speaking of Asa, King of Judah in the Second Chronicles, 16th chapter, 12th verse, it says:

> And in the 29th year of his reign, Asa was diseased in his feet; his disease was exceeding great; yet in his disease he sought not to the Lord but to the physicians. And Asa slept with his fathers.

So the humourists of the present day say that Marc Antony's phrase, "The evil that men do lives after them", does not apply to doctors, and likewise that when we speak of "patience on a monument", it has no reference to the doctor's patients who are under the monument.

To the layman the language employed by both professions is portentous and in this opinion of the terminology used by doctors, the lawyer agrees with the layman, forgetting, in his familiarity with it, how strange his own appears. Gradually, however, he comes to realize that the anatomical terms used by the doctor, while apparently strange and involved, have the great quality of universal application, and, unlike his own, are not subject to jurisdictional limits or legislative change. In addition to having the merit of a *lingua franca,* it soon appears that these terms are not merely a congeries of polysyllables but have a distinct aptness and quaintness. As the Scotchman called his donkey "Maxwelton", because her brays were bonnie, many are named after objects they resemble—the bird's nest of *cerebellum,* the *arachnoid* (like a spider's web), the *cauda equina,* (the horse's tail of the spinal cord), the *tragus,* the *ulna* and a host of others. When similarity fails the doctor is not daunted, as he deftly calls the large hip bone the *os innominatum* (the nameless bone), because it does not resemble any known thing. The suspicion remains, however, that some of the terms used are unnecessarily pedantic, as it is obviously putting language on stilts to call a plain ordinary mustard plaster a "sinapism."

This same language is a fearsome thing to the young lawyer when he comes to view the doctor in the new aspect of witness. Few lawyers, even though meeting doctors often in this relation, acquire a deep knowledge of anatomy or medicine. Attorneys engaged in the trial of cases necessarily frequently encounter doctors as witnesses, in the guise of family physician, alienist, neurologist, toxicologist, surgeon and occasionally one who grandiosely blends all these in his testifying. It is in this operation of testifying that the

* A paper given before the Cleveland Bar Association, January 6, 1931.

lawyer meets him, and then, though he looks on the doctor with his own eye, he must speak the doctor's language. While he cannot hope to know this fully, he should know well the things regarding which he does speak. He will not be entirely alone in knowing only a part of the subject as, in this age of medical and surgical specialists, it has been well said that they are coming "to know more and more about less and less." Such specialization is reaching the stage where we may find that an expert on the gastrocnemius may think that the jejunum is a Hindu god or that the fissure of Sylvius is a geological fault.

The lawyer is keenly aware that the doctor is himself without full knowledge of his own subject. While he has passed beyond the stages where exorcism, incantation and horrific potions were eked out in small measure by some form of rational hydrotherapy and diet, the spleen and many other organs still hold mysteries for him, and, as the Argonauts of the medical profession sailed for generations on the blood stream before they landed on the islands of Langerhans, so still, despite their learning, he has many truth-seeking adventures in store. No longer can it be said that he puts into the human body, of which he knows nothing, nostrums of which he knows less, but he is baffled by much that is yet inscrutable.

Depending upon the nature of his work, the lawyer will acquire a certain knowledge of the doctor and his work, of various types according as he appears in criminal causes, cases involving minds deficient or affected, or the greater body of litigation involving traumatism as a basis of damages. In this latter some knowledge of anatomy is requisite, and the lawyer feels that he is progressing when he is able to differentiate the periosteum, the peritoneum and the perineum. He soon knows that the scaphoid and the sphenoid are at opposite ends of the body and learns the difference between systolic and diastolic. He should know something about the structure of the spine, and the osteogenetic processes, what an epiphyseal line is and in a general way the nature of the reflexes. The fact that the channels of the meningeal arteries may cause some confusion in reading an x-ray plate will some time intrude itself. He may find that the case before him involves Landry's disease, the popliteals, concentric hypertrophy of the heart, or an epilepsy. He will know that, with few exceptions, the rule is that the arteries carry blood from the heart and the veins carry it to the heart, but this knowledge will not alone serve him in a case of aneurysm or aortic stenosis. He will acquire a smattering knowledge of the bromides, the opiates, some medicaments and even the amiable placebo.

Thus equipped, he looks upon the doctor, intent upon getting the truth from him, if he has to perform a major operation to do it. The doctor has sworn to tell the truth, the whole truth and nothing but the truth, and the lawyer is bound by his oath of office to seek the truth. In such situation, theoretically, there should be harmonious concord, but actually, and with no necessary diminution of honesty in either, the examination of the one by the other assumes often the appearance of a contest. The doctor testifying, either as an attending physician or as an expert, has greater general knowledge of his subject than the attorney. The court, however, will charge the jury that they are not bound to believe the witness, but shall pass their own judgment upon his learning and veracity. The examining counsel knowing this, and knowing something of the subject under discussion, and, if he be wise, knowing that small portion well, can bring out more clearly what he deems to be the truth or correct the incorrect. The comparative scantiness of his equipment is no necessary deterrent, if he is content to use what he knows. But counsel should be careful to restrict his examination within his own abilities. He is very much in the position of Noah fishing from the Ark because, although Noah could go fishing, he could not fish long, as he had only two worms for bait. When he enters upon a subject he ought to know what is important to ask and be content with that. The merit of this line of proceeding is well illustrated (in a different situation) in the case of *United States v. Amo*, reported in the 261st Fed. Rep., 106, which was a criminal proceeding upon the charge of selling liquor to Indians. The court, in the opinion, says that the Indians used to visit the saloon and buy liquor from a person who was ready and willing to sell to them. The opinion says, "They slowly approach the bar and say, 'whiskey'," (which may be the only English word they know, and, as one of the Indians said, "That is enough to know"). So, as in all speech, the art of knowing when to stop is exceedingly useful in the cross examination of a medical man.

Ordinarily, there is little real conflict between the medical witness and examining lawyer, but only the routine of elaboration and clarification. When the doctor is testifying on the right side, *i.e.*, the examiner's side, the concurrence of thought is exceedingly gratifying. At times, however, where the physician assumes the attitude not merely of a witness but of a paid protagonist of certain claims, the colloquy assumes the aspect of a fencing bout or even a duel, and some members of the medical profession are certainly as adroit as their then opponents. It is at times hard to reconcile their opinions, or perhaps we would better say, their testimony, with the

opinions of some of their brethren, and the frequency with which certain easily simulated troubles are relied upon excites suspicion. Ultimately, the trial lawyer comes to look with a gloomy eye upon the claim of sacroiliac separation from injury, which is a rare condition, but is often claimed for and likewise the exophthalmic goitre from the same cause. Remarkable examples of testimony as to proximate causation and physical results have occurred in the history of all trial lawyers, some going as far as the type described in *Miller vs. Paulson*, 169 N. W. Rep., 203, where the court said of some medical testimony:

> It is the kind of testimony which, in type, gives an opinion that death ensued from a bullet wound because the deceased at one time raised Holstein cattle.

The offending witnesses, however, are exceptional, and simply form a little kakistocracy in the great body of medical witnesses, and the lawyers, because they are in the rôle of antagonists, and ordinarily of good sportsmanship, consider them rather tolerantly.

The lawyer is, of course, familiar with difference of opinion, as it is partly by such a stream that his own mill wheel is turned. But sometimes he finds it impossible to give credence to statements based upon physical facts in opposition to information which he knows to be sound and honest. The conclusion he comes to is that such testimony is the result of a desire for acquisition rather than scientific inquisition, and is to place the accent upon the syllables "jury" in the word "injury". These witnesses are usually more facile in expression than learned and cause one to think of Senator Foraker's description of the Platte River—"six inches deep and six miles wide at the mouth." On the whole, however, the understanding between the two professions is good and the doctors adopt toward the lawyer much of the attitude of the newly converted church member who said he was willing to do anything the Lord asked, so long as it was honourable. This was illustrated in the instance of the criminal lawyer who was in dire need of a postponement of a case, but was refused it by a flinty faced judge. He sought a doctor friend, who immediately sent him to a hospital and performed an appendectomy, which necessarily put the criminal case over two weeks. As the lawyer and the doctor agreed, he did not need his appendix, and he did need the postponement.

These doctors are human after all, as evidenced by their propensity to disregard their own advice. They preach against tobacco, even as the blue smoke upward curls from the briar root between their teeth and, despite the fact that they decry alcohol, denatured or good natured, the sight, in pre-Volstead days, of a schooner going into dry doc(k) was not limited to shipyards. Since that time, lawyers, low in spirits, have sometimes found medical friends who have prescribed decoctions of rye or corn for them and have tested them in their company, probably to be assured of their purely vegetarian qualities!

Despite this close association the lawyer, in common with the general public, has given little thought to the work or history of the medical profession because we have taken them so much for granted. Short contemplation brings sharply to us that these craftsmen are more often great than famous. This very lack of fame is, perhaps, one of the best signs of their worth. The average individual has a general knowledge of Harvey, of Jenner, of Pasteur, of Lister and some of the great figures in surgery or medicine of the present day. But the list is far too small. The name of Hippocrates, in connection with the Hippocratic oath, of Vesalius, or Galen may be known to him. The great advance when the ligature took place of the cautery in amputations, under Ambroise Paré in the 16th century, arouses his interest; the boon to humanity when the general anæsthetics, nitrous oxide, chloroform and ether appeared, followed by cocaine as a local anæsthetic, in the 19th century, stimulates his attention and gratitude.

In the last generation or so, how much has been done for the health of the world—what great discoveries have been made. Insulin for diabetes, vaccination against typhoid, antitoxin for diphtheria, the x-ray, and the discovery of the relationship of the mosquito to yellow fever, to mention only a few. Incalculable has been the amount of distress saved to mothers by the diphtheria antitoxin—disregarding the weal of the patients themselves. And generally mental health as well as the physical, through the abatement of fear, has been improved by these discoveries.

Without banners or fanfaronade the members of the medical profession have devoted themselves to work which has been beneficial in every aspect. That work has been practically the antithesis of the great staple of history and public adulation—the combat of armed men. Though few ballads have been sung about them, and prose and poesy have been equally silent, they have gone quietly and often alone where the "deeps of misery" have engulfed human kind. When the angel of death is abroad, and so close at hand that you can almost hear the beating of his wings, to paraphrase John Bright, there the doctor is also. When and wherever the great plagues and the terrible roster of fevers have struck in terror, there and then by their quiet and commonplace acceptance of responsibility and danger, they have set their muniments of title

to honour. We read of armies, great and small, whose cavalry and cannon have clattered and rumbled through all history, and the great war captains loom larger in every imagination, but we have little thought of the doctors following after, doing what they could to ease or salvage the bodies torn by "the dogs of war". What do we reck of the surgeons who went in the trains of Gustavus Adolphus, of Tilly, of Alva or of the Prince of Orange? Yet they were of the brave. As Henry Cavanagh, a civilian who went out from Lucknow, disguised as a native, to mingle with the enemy at that famous siege, was known as "the bravest of the brave when all men were heroes", so doctors often qualify for a like title. The men who have spent years searching for, and contending with, the germs that work devastation, including some who have vicariously sacrificed themselves in such work, have been heroes, though not heroic in pose.

Of that ilk, of less colour, but forming the very fabric of the profession, are the men we have all known, who lived quietly in communities until they became institutions therein, the local doctors, covering in many cases large stretches of territory, living lives of little interest except as their work gave them interest. Travelling on horseback or in swaying buggy, through heavy weather and on heavy roads to humble home and outlying farmstead, they led lives of wearying days and disturbed nights, dealing with all varieties of physical ills, and after years of anxious vigil and broken rest, died like Nicanor of old, in harness, to sleep in some village churchyard the sleep that "not poppy, nor mandragora, nor all the drowsy syrups of the world could give."

Men and Books

WILLIAM DUNLOP*
1792 – 1848

By Col. F. S. L. Ford, C.M.G., R.C.A.M.C.,
M.D. No. 2,
Toronto

"Nature formed but one such man,
And broke the die."
"A nice unparticular man."

I have been asked to tell you something about Dr. William Dunlop, the subject of the fine portrait in oils which is being so kindly presented to the Academy of Medicine by Mrs. J. M. Mussen.

Before beginning my brief sketch of Dr. Dunlop, may I say that this presentation tonight is the culmination of a series of incidents extending over quite a long period. Some ten years ago, being at Niagara Camp for the annual training of the militia, I was struck by the relative pretentiousness of the museum of local antiquities, and was fortunate in making the acquaintance of the creator and curator, Miss Janet Carnochan. This lady kindly made possible a personally conducted tour of the museum, and by her illuminating comments added much to the pleasure of the occasion. Among the treasures of the place, she pointed with pride to a portrait, hung high on the wall, and, I must say, more or less concealed by an accumulation of the dust of many camps, for the drill-ground adjoins the museum, and soldiers have been hereabouts for nigh unto two hundred years. Standing in front of it, and gazing with eyes undimmed by her three score years and ten, she said, "There is the picture of the doctor who attended the wounded from the battle of Lundy's Lane, in Butler's Barracks, some of the buildings of which you may see if you will look out of the window. This is the portrait of 'Tiger' Dunlop."

Now some years ago, while at Goderich, Ont., a friend had driven me across the Maitland River to Gairbraid, the one-time home of Doctor Dunlop and his brother, Robert Graham Dunlop, to see the spot that these remarkable men selected for their home in the wilderness, when, after years of faithful service to their King in many lands, they said to Scotland, "My native land, good night". Here upon the brow of a hill that slopes to the shining river, and that gives upon one of the most beautiful prospects to be seen anywhere, the brothers were buried, and to judge by the deep worn foot-path up the steep hillside, many still make pilgrimage to the place of the cairn. So it was that I was much impressed at the sight of the portrait, and, upon inquiry, found that it had been loaned to the museum by Mrs. Mussen, in whose family it has remained for many years. The name of the painter is not known, but it is extremely unlikely that it was painted in this country.

In attempting to sketch the life of Doctor Dunlop, in the presence of one who is really his biographer, one must feel a certain amount of trepidation. Those of you who have not read "In the Days of the Canada Company", published in 1896 in this city, still have before you the "pleasures of hope" that you may sometime travel the Huron Tract in company with the

* Read before the Academy of Medicine, Toronto, on Library and Historical Night, January 6, 1931.

authors of this charming work. We have with us to-night one of the gifted ladies to whose pens we and all Britishers are deeply indebted. I hope that Miss Lizars will tell us something of how she and her sister came to write this epic of the forest, and lake and stream. There is comfort in the knowledge that any inaccuracies of statement on my part will here and now be corrected, and will not be transmitted for the confusion of future generations, for her book contains the most complete, the most sympathetic and the most authentic biography of "The Tiger" that has seen the printed page.

How often it happens that men are remembered more by some phrase they have made, or some catchword they have invented, than by their more substantial achievements. There come to mind the words of the late President Wilson, "Too proud to fight"; Mr. Asquith's "Wait and see"; Von Bethmann-Hollweg's "A scrap of paper." These phrases and words are handed down through the years, and we forget all the other things these men said or did, and remember only the trivial. We have a notable example of this in the case of the late Sir William Osler, whose joke was too subtle for the average citizen, and what he meant to be a jest was taken in earnest. So it is with the subject of this sketch. He made a most remarkable last will and testament it is true. But he also did many and greater things. Of course no sketch of Dr. Dunlop would be complete which did not include reference to this document or even its publication in full. The lesson to be drawn, however, seems to be that the man who could write such a will was no ordinary person, but one who had strong convictions and was not afraid to express them, even posthumously.

One day John Haldane and his son walked over to Gairbraid for a friendly call. The Doctor had just finished writing his will, which he read to them, seated at the big mahogany table, the "Twelve Apostles" being present.

"In the name of God. Amen.

"I, William Dunlop, of Gairbraid, in the Township of Colborne, County and District of Huron, Western Canada, Esquire, being in sound health of body, and my mind just as usual (which my friends who flatter me say is no great shakes at the best of times), do make this my last Will and Testament as follows, revoking, of course, all former Wills:

"I leave the property of Gairbraid, and all other landed property I may die possessed of, to my sisters Helen Boyle Story and Elizabeth Boyle Dunlop; the former because she is married to a minister whom (God help him) she henpecks. The latter because she is married to nobody, nor is she like to be, for she is an old maid, and not market-rife. And also, I leave to them and their heirs my share of the stock and implements on the farm; provided always, that the enclosure round my brother's grave be reserved, and if either should die without issue, then the other to inherit the whole.

"I leave to my sister-in-law, Louisa Dunlop, all my share of the household furniture and such traps, with the exceptions hereinafter mentioned.

"I leave my silver tankard to the eldest son of old John, as the representative of the family. I would have left it to old John himself, but he would melt it down to make temperance medals, and that would be sacrilege—however, I leave my big horn snuff-box to him; he can only make temperance horn spoons of that.

"I leave my sister Jenny my Bible, the property formerly of my great-great-grandmother, Bethia Hamilton, of Woodhall; and when she knows as much of the spirit of it as she does of the letter, she will be another guise Christian than she is.

"I also leave my late brother's watch to my brother Sandy, exhorting him at the same time to give up Whiggery, Radicalism, and all other sins that do most easily beset him.

"I leave my brother Alan my big silver snuff-box, as I am informed he is rather a decent Christian, with a swag belly and a jolly face.

"I leave Parson Chevasse (Magg's husband), the snuff-box I got from the Sarnia Militia, as a small token of my gratitude for the service he has done the family in taking a sister that no man of taste would have taken.

I leave John Caddle a silver teapot, to the end that he may drink tea therefrom to comfort him under the affliction of a slatternly wife.

"I leave my books to my brother Andrew, because he has been so long a Jungley Wallah, that he may learn to read with them.

"I give my silver cup, with a sovereign in it, to my sister Janet Graham Dunlop, because she is an old maid and pious, and therefore will necessarily take to horning. And also my Granma's snuff mull, as it looks decent to see an old woman taking snuff.

"I do hereby constitute and appoint John Dunlop, Esquire, of Gairbraid; Alexander Dunlop, Esquire, Advocate, Edinburgh; Alan C. Dunlop, Esquire, and William Chalk, of Tuckersmith; William Stewart and William Gooding, Esquires, of Goderich, to be the executors of this my last Will and Testament.

"In witness whereof I have hereunto set my hand and seal the thirty-first day of August, in the year of our Lord one thousand eight hundred and forty-two.

"*W. Dunlop* (*L.S.*)

"The above instrument of one sheet was, at the date thereof, declared to us by the Testator, William Dunlop, Esquire, to be his last Will and Testament, and he then acknowledged to each of us that he had subscribed the same, and we at his request signed our names hereunto as attesting witnesses.

"*James Clouting,*
"*Patrick McNaughton,* (*L.S.*)
"*Elizabeth Stewart.*

His guests were amused, but the elder Haldane was a trifle shocked.

"Doctor, are you not wrong to treat so sacred a subject in that way? I consider that it will invalidate the will".

"That is serious." The Doctor drove the unwieldly Peter nearer Mr. Haldane. "I shall enclose it to my friend Colonel Prince, and if he concurs with you I shall alter it."

Colonel Prince wrote on the document in answer: "I have perused the above Will. It is eccentric, but it is not in that sense illegal or informal. To a mind who knows the mind of the testator it will remain a relict of his perfect indifference (an indifference to be commended, in my opinion), to what is called Fashion, even in testamentary matters. I conceive it to be a just and proper Will, and no

person can question its legality in point of form or substance." As he further said, it bore evident marks of authenticity, and it was needless to change it. However, in 1845, with Colonel Prince as his personal adviser and one of the witnesses, Dunlop thought fit to make a codicil embracing a few minor changes.

The third son of Alexander Dunlop, laird of Keppock, William Dunlop, was born in Greenock in 1792. His family was a prominent one in the community. He was descended through his great-great-great-grandmothers from Robert the Bruce. His uncles and great-uncles were professors in the Universities of Edinburgh and Glasgow, his great-great-grandmother being sister to Principal Carstares, of the former seat of learning, who was the adviser in chief to William of Orange, and hence nicknamed "The Cardinal." His father, Alexander Dunlop of Keppock, was born in 1766, and became a banker in Greenock. He was twice married, first to Janet, daughter of Robert Graham of Gairbraid, and afterwards to Margaret daughter of William Calquhoun of Edinburgh. By his first wife he had three sons and one daughter.

John, who was known as the Temperance Reformer; Robert, a captain in the Royal Navy; William, called "The Tiger;" Janet who died unmarried. By his second marriage he had four sons and five daughters. There were, therefore, six brothers and six sisters of the subject of our sketch, of whom nine were of the "step" degree of relationship.

It is said that the second wife did not make a kind stepmother. Anyhow, Robert, the second boy, ran away from home, as did William, the third son, later. For years nothing was heard of Robert, until news came that he was a post-captain in the Royal Navy, which he joined as a cabin boy. His life was full of adventures and peril. He was in ninety-two engagements, and wounded three times, twice severely; a musket-ball in the knee caused a permanent disability; a bayonet thrust in the hand crippled that member; while a cannon-ball, passing between his uplifted arm and his side, fractured three ribs. He was a dapper little man, kindly and urbane, devoted to his pipe and his book, and fond of the fireside, longing to enjoy a slippered ease, "and that serene which men call age." He was deeply attached to his big brother William, an affection warmly returned by the younger man, which continued even unto death. Nor did the grim reaper disperse his sheaves, for the brothers lie side by side under the cairn at Gairbraid.

Such were the forbears of William, the Tiger, destined in his own right to a goodly share of the family fame, and to exemplify his own quotation:—

> "Cœlum, non animum, mutant,
> Qui trans mare currunt".
>
> The sky, not mind, they change,
> Who o'er the ocean range.

He who was born and reared beneath grey Scottish skies, who sped convivial nights, oblivious of London fogs, was to prove climatic conditions as diversified as those of "Greenland's icy mountains and India's coral strand."

> Impelled by fate, he forayed far afield,
> With Faith and Works emblazoned on his shield.

With such an ancestry, it is not hard to imagine that his education was well looked after, and we are not surprised to find that in January 1813 he was appointed Hospital Mate, and in the following month Assistant Surgeon to the 89th Regiment. That his education was not restricted to medicine may be affirmed with some degree of assurance, for all through his life he continued to be a writer of graceful English, and, when occasion demanded, could be most forceful and direct. His descriptive writing has great charm when employed in relating his experiences by flood and field; and his various reports, while in the service of the Canada Company, are models of clear and convincing English.

To account for this literary bent, one must consider the period of English literature which synchronized with his birth and early life. The age of satire had passed, and that of sense and sensibility had faded into the romantic revival, which may be said to have begun about 1780, and continued for fifty odd years. It was the age of Wordsworth and Burns, of Scott and Shelley; of Coleridge, and Byron and Keats. In the field of criticism and the essay the shining names of the period are Coleridge, Lamb, De Quincey, Wm. Hazlitt and Leigh Hunt. The great critical reviews, The Edinburgh, The Quarterly, Fraser's, and Blackwood's, came into being early in this period. Dunlop's youth corresponds with this fertile period of English letters, which influenced him profoundly, as the events of his life show.

The end of March, 1813, found him at the Depot in the Isle of Wight, awaiting orders to join his regiment, which was in Canada, engaged in "Mr. Madison's War" then being waged between Britain and the United States. He says that he visited the Officers' Mess at Parkhurst Barracks but once during his stay on the Isle of Wight, "and saw, among other novelties of a mess table, one officer shy a leg of mutton at another's head, from one end of the table to the other. This we took as notice to quit."

Early in the August following, he sailed for Canada, in an ill-found, crowded transport, and spent over three months on the ocean, en route to the scenes of his future labours and adventures. He arrived at Quebec at the beginning of November, after a most tedious and tempestuous voyage, and, with his venerable Colonel, Donald McBean, having reported to the General Officer Commanding, set sail in a schooner bound for Montreal. Their progress was so slow that they landed below Three Rivers in the hope of catching a steamboat at that place. They missed the boat however, and proceeded by land to Montreal,

terminating the journey by the stage coaches maintained by the Government of the day.

Arriving at Montreal, they found that the Americans under General Wilkinson were coming down the river in the hope of making a junction with the American forces descending the Richelieu River. The militia of Lower Canada was being mobilized, and Colonel McBean, on account of his wide military experience, was appointed to command a large brigade of militia. Naturally, he selected for his Principal Medical Officer the Assistant Surgeon, who had crossed the Atlantic with him.

The brigade was concentrated at Lachine and Colonel McBean and Dunlop arrived there a few days before the impending battle. On the 11th of November, Colonel Morrison, of the 89th Regiment, with about eight hundred men, gave battle to and defeated the Americans at the battle of Chrysler's Farm. The enemy crossed the river seven miles above Cornwall, and encamped on the south shore of the St. Lawrence, where they remained for the winter. Thus Dunlop's tenure of appointment as Principal Medical Officer came to an abrupt end.

The militia at Lachine being sent home, and the marines and sailors to Kingston, he proceeded to march up the river with the troops bound for Fort Wellington. The roads were almost impassable, so they marched in the fields, climbing the farm fences, and making the best of their way by land, or occasionally for a few miles by boat. He was not sorry, therefore, when ordered to remain near the scene of the late battle, to look after the wounded. After a few weeks he was able to send them to the Montreal General Hospital. Relieved of his charges, he proceeded to join his regiment at Fort Wellington, near Prescott. The village then had but five houses, three of which were unfinished. As it was necessary to keep small bodies of troops at points along the frontier, to form a rallying point, in case of invasion, for the militia and Indians, the Grenadier Company of the 89th was ordered to a block-house in the woods near Gananoque, where he and the junior subaltern were billeted in a disused forge, one room of which was occupied by a tailor whose rags and clippings were excellent caulking for the chinks between the logs. With a roaring fire, and a table well supplied with game of all kinds, to say nothing of the potables so much in evidence at that period, they were not only able to make themselves most comfortable, but prove admirable hosts to friends who paid them frequent visits.

"We passed the remainder of the winter as officers are obliged to do in country quarters. We shot, we lounged, we walked and did all the flirtation that the neighbourhood of a mill, a shop, a tavern, with two farm houses within a reasonable afternoon's walk, could afford. We were deprived, however, of the luxury of spitting over a bridge, which Dr. Johnston says is the principal amusement of officers in country quarters, for though we had a bridge close at hand, the stream beneath was frozen." Early in the spring, he rejoined his regiment and was quartered with two companies in the then insignificant village of Cornwall, which at that time did not contain twenty houses. He relates an amusing incident which occurred during his stay at Cornwall, in which a visitor, introducing himself as Major —, of Vermont State, sold a drove of cattle to the colonel of the 89th, and after he had been paid, said, among other things, "They do say that it is wrong to supply an enemy, and I think so too; but I don't call that man my enemy who buys what I have to sell, and gives a genteel price for it. We have worse enemies than you Britishers."

While in Cornwall, Dunlop was quartered at the village inn; a log house presided over by an Irish widow, named Peggy Bruce, whose late husband, a Scotch sergeant, had left her the business, which she continued in a manner most acceptable to her patrons. "The sign was a long board, decorated by a formidable likeness of St. Andrew at one end, and St. Patrick at the other, and the whole surrounded by a splendid wreath of thistles and shamrocks." The account of his adventures, excursions, and alarms, while the guest at this hostelry is well worth reading.

Towards the end of June his regiment left Cornwall for Niagara, but Dunlop remained behind, awaiting a relief. When this arrived, he marched to Kingston with a detachment of the Canadian Fencibles. From Kingston he started for York (Toronto) by boat, but, after proceeding twelve miles against a head wind, he landed, and with another officer rode to York, some days doing seventy-five miles. This was accomplished by telling the various post-houses that they were officers of high degree and had to have the best horses in the stables.

At sunset on Sunday, July 26th, 1813, they embarked on a gun-brig, the same probably which had as a passenger the Commander-in-Chief, Sir Gordon Drummond, and reached Niagara on the morning of the 25th. The Battle of Lundy's Lane was in progress. Large numbers of wounded were brought down the river road in wagons, and Dunlop attended them in Butler's Barracks. A little later he was moved up the river to Chippewa and operated what we today would call a casualty clearing station. After a short time, he was sent to Fort Erie as medical officer. The assault on this fort on the 15th August was one of the bloodiest and most futile battles of the whole war. Lieut.-Colonel Drummond, of the 104th, and Lieut.-Col. H Scott of the 103rd, were killed. Three months before, the 89th went into battle five hundred strong; it came out of the assault reduced to sixty, with one captain and two lieutenants and the medical officer, Dr. Dunlop. The number of British dead left on the field was 222, while 174 wounded, and 186 unwounded prisoners remained in the hands of the enemy. The Americans lost 17 killed, 56 wounded and 11 taken prisoners, a

total of 84 men. The total British loss was 905 men. One reason for this disastrous result was the order given to the troops before the assault to remove the flints from their muskets, to prevent an alarm being given by a premature shot. Says Dunlop, "In the British Army one would suppose that the only use of a musket was understood to be that it could carry a bayonet at the end of it."

He gives an interesting account of the Soc, or Sac, Indians, whose chief, Mautass, bore such a strong resemblance to George III that even the tribe called the head on the half penny "Mautass." It was here too, that he merited, by his gallantry, the Victoria Cross, had such a decoration existed; for he carried out of the firing line, on his back, "like sacks of potatoes," ten or a dozen wounded men, the last of whom received, en route, a bullet in the back, which else had ended the doctor's career, as it did that of the recipient. He also brought, slung over his shoulders, six wooden canteens of wine, with which he refreshed his patients. The young giant of twenty-two, was medical officer, stretcher-bearer, and orderly, all in one.

We may pause here to give a description of Dunlop's appearance in 1814 on the Niagara Frontier. "He was at that time a young man who appeared to have outgrown his clothes; at least the sleeves of his coat reached but a short distance below his elbows, and his trousers did not nearly reach his ankles. He was careless, if not slovenly, in his dress, and he seldom applied a razor to his chin. His paw was almost Herculean, and his movements and gait were awkward and ungainly." The writer goes on to say, "Those who enjoyed the friendship of this warm-hearted man had frequent opportunities of knowing his kind and feeling disposition, for there never was a finer jewel, though roughly set, than Dunlop. His cheerful and undaunted spirit formed him for an efficient leader of British emigration."

Nineteen years later, 1833, *Fraser's Magazine* has this to say of him:—"This remarkable biped, who is now in London for a few weeks to worry Goderich and Howich about some beastly proceedings of our degraded government, stands six feet three inches—and measures two feet eight across the shoulders: in the graphic language of Rimini Unt:—

"Lightsomely drops in his lordly back;"

the calf is just twenty inches in circumference—*ex pede Herculem;* the paw would have startled Ali Pacha; the fur is of the genuine Caledonian redness and roughness; and the hide, from long exposure to Eurus and Boreas, has acquired such a firmness of texture, that he shaves with a brickbat. As he sails again for Galtopolis in the course of a few weeks, we earnestly recommend to Lord Egremont the propriety of placing the next cargo of "respectable female emigrants from Sussex," under his protection. "Farewell, noble savage, wild as thy woods. When shall we again revel in the rich luxuriance of thy anecdotes—or shake under the Titanic bray of thy laughter?"

Late in the autumn, he removed his wounded from Niagara to York, and used the only church in the place for a hospital. This church had been saved from destruction by the Americans through the remonstrances of the rector, the Reverend John Strachan. In December, 1814 the Government proposed to build a large warship on the upper lakes to combat the American naval forces in those waters. Penetanguishene, about thirty miles from Lake Simcoe, was chosen as the site for the new dockyard. The expedition was commanded by Lieut.-Col. Francis Cockburn, of the Canadian Fencibles, and with one company and about the same number of militia, proceeded up Yonge Street to Lake Simcoe. When they arrived at the lake, the ice was not strong enough to bear them, so they waited two days, at the end of which time Doctor Dunlop skated over the lake to try the ice, a distance of twelve miles. The next day they all crossed, in spite of the fact that the ice had broken up into large cakes during the night. Nothing daunted, they tied themselves together with ropes, and, although many of them fell into the icy waters, they were pulled out by their comrades, and all reached the other shore, after six hours of arduous and dangerous travel. Once on shore, a big fire of logs was lighted, and the camp cooks prepared a savoury dinner, which, with the inevitable issue of rum, sent them to their spruce boughs weary and content.

One afternoon, the Doctor, with his dog, left camp to explore the country ahead of them. He got lost in the woods, and tramped for hours, until he realized he would have to wait until daylight to see his tracks. He trod a deep trench in the snow, and taking off his snowshoes, he poured a quantity of rum into his moccasins, pulled down his fur cap, drew on his fur gloves, put his hands over his face, and hauled the dog in on top of all. Possibly all of the rum had not gone into the moccasins, for he slept soundly until the sun was an hour high. His feet were frozen, and hands frost-bitten. He shuffled back to camp, unable to tie on his snowshoes. He was treated by two old French-Canadian woodmen with poultices of beech leaves, and after three weeks recovered. The poor dog did not fare so well, for in the words of Goldsmith,

"The man recovered from the bite,
The dog it was that died."

Although it was the dead of winter, the work was carried on to a successful issue, and early in March they had nearly reached their objective, when, in Dunlop's words, the "appalling intelligence" arrived that peace had been declared, which meant the prospect of half pay. The regiment marched down the river to Quebec, sailing for the old country, and Dunlop with his comrades were on the ocean that June day on which was fought the battle of Waterloo. He never ceased to regret his absence from the great fight.

After eighteen months in England, spent to his "own great satisfaction," he was placed on

half-pay, but not for long, as he was shortly afterwards ordered to join his regiment in India, where he remained until 1820, where, on account of his health, which was much impaired by what was then called jungle fever, he returned home. Not all of his stay in India was spent with his regiment, for he was placed on half pay on January 25th, 1817, and for the remainder of his time in India, he was engaged in journalism. He wrote articles for various magazines supporting the policy of the East India Company, when it came under the adverse criticism of James Silk Buckingham, the proprietor of the Calcutta Journal. Buckingham's newspaper was suppressed, and he himself was expelled from India, but subsequently received a pension of £200 per year from the Company as compensation. He afterwards sat in parliament for Sheffield.

It was during his residence in India, that Dunlop got the nickname of "Tiger," not from any resemblance in appearance or temperament to the "king of cats," as one writer puts it, but in much the same way as the sobriquet of "Buffalo Bill" came to William J. Cody. The latter got his nickname from killing so many buffaloes to supply American navvies. Dunlop got his nickname from his exploit in clearing the island of Saugar, in the Ganges, of a number of man-eating tigers. It is said that on at least two occasions he quelled this ferocious beast, when at close quarters, by emptying his snuff-box into the face of the intruder. Returning to Britain in 1820, he relates that, at the Cape of Good Hope, where he remained a few days, he met a brother of Lieut.-Col. Drummond, who fell at Fort Erie in 1814. Since that time, Dunlop had worn a string of wampum, which had been a gift to Drummond from the Indians. Upon learning that the officer was a brother, he took off the beads and presented them to him. He settled in Edinburgh, and gave lectures at the University on medical jurisprudence, and wrote sketches of life in the Orient for several magazines, including Blackwood's, it is said, under the pen name of "Colin Ballantyne, R.N.," which he had used in India; but I have been unable to verify this from the files of Blackwood's Magazine.

He departed from Edinburgh, some say tormented by the fires of jealous affection, or at least the pangs of despised love, and went to London, where he edited the British Press Newspaper, which did not last long. An edition of Beck's "Medical Jurisprudence" next engaged his attention, together with the publication of a Sunday newspaper, but he tired of the latter, and at the end of the year became connected with certain joint stock companies in the capacity of secretary or director. He had nothing to do with the promotion of these ""wild cats," and made nothing out of them except his salary, for as a contemporary says, "Tiger is an honest fellow—a strictly honest fellow in every sense of the word." It was during this period that he formed a social club called the "Pig and Whistle," where he and his friends were wont to burn the midnight candle.

The years 1820-25 were marked in Britain by the promotion of all sorts of companies for the exploitation of all sorts of natural resources, and may we add, all sorts and conditions of men. Just why this phase of human nature should obtrude itself at the conclusion of wars is an interesting question, which, for the purpose of this sketch, must remain unanswered. Most of the companies promoted during those years passed into oblivion in a very short time, with most disastrous consequences. The Canada Company, however, was a brilliant exception to the rule. Organized with a capital of £1,000,000, and getting its charter in August 1826, it played an important part in the settlement of the counties of Huron, Perth, Waterloo, and adjoining communities, and, though with abated head, exists even until this day.

John Galt, the friend of Scott, was appointed Superintendent of the Company, the promoters of which, for some years prior to the granting of the Charter, had been negotiating with the governments of Britain and of Upper Canada for the purchase of 1,300,000 acres of Crown Reserve lands, and 800,000 of Clergy Reserve lands in that province. The price fixed by the Commissioners appointed to appraise the lands was three shillings and six pence per acre. As the sale of the Clergy Reserves was successfully opposed by the Reverend John Strachan and his associates, 1,100,000 acres of land in the western part of the province, known as the "Huron Tract," were exchanged for them, on the same terms. A vast area in one block thus passed under the control of the Canada Company, and proved to be the most valuable of all their holdings.

Galt's career is one of great interest. Born in Ayrshire in 1779, he was trained for business, first in the Customs, and then in mercantile life. When five and twenty years of age, he went to London, and engaged in business for himself, but after three years he went into bankruptcy. He then decided to study law, and entered Lincoln's Inn, but, in 1809, ill health necessitated a long sea-trip, which he took to the Mediterranean, where he met Byron, of whom he afterwards wrote a "Life."

The disruption of trade caused by the Berlin and Milan decrees of Napoleon had created a great demand in Europe for British goods, and smuggling was a highly lucrative, if hazardous, undertaking. While on the Mediterranean voyage Galt conceived the idea of "bootlegging" goods into Europe, by way of the Balkan backdoor, at which began the madness of 1914, and through which, in 1918, slow-pacing Peace entered the devastated European household. "After negotiations with Glasgow, an arrangement was concluded, and, under Galt's direction, a pioneer train of forty-five camels started from Salonica, laden with two hundred bales of British goods, which reached Widdin on the Danube in safety."

In 1813 he married Elizabeth Tilloch, and, giving up both law and commerce, turned to

literature as a means of making a living. Some of his work is first-rate, and will endure. He was a voluminous writer, but his literary productions were "in divers tones" and of unequal merit, due in part to his indifferent health, particularly after he returned to England in 1829. He became interested in Canada through acting for the Canadian claimants for losses suffered in the war of 1812, and visited Canada in August, 1824, as one of the five Commissioners, to value the lands which the Canada Company proposed to buy. His son, Sir Alexander Tilloch Galt, became a prominent figure in Canada, and was one of the Fathers of Confederation.

In coming to Canada as the Superintendent of the Canada Company, Galt chose Dunlop as his right hand man, probably on account of the latter's former experience in Canada; his selection, no doubt, being influenced, also, by the Tiger's social and literary attainments. They arrived in York (Toronto) on the 12th day of December, 1826, by way of New York and Buffalo. Soon after their arrival they proceeded to Quebec, where the Earl of Dalhousie held court as Governor. Their object was to press the claims of those who had suffered losses in the War of 1812, and to register the Company's Charter. After a gay season at the ancient capital, they returned to York by sleigh, arriving cold and hungry at the hotel. No food or drink being forthcoming, their servant was sent out to forage, and returned with two frozen herring, some biscuits, and two bottles of champagne, one of which survived the feast, to reappear later at a most unexpected time and place.

On the 19th day of March, 1827, a letter, written at York, instructed Dunlop, whose official designation was "Warden of the Forests," to "proceed to the proposed scite of the city of Guelph, which scite you will carefully and diligently examine and should it appear to you that it is inconvenient or ineligible you will make a tour of the Guelph block for the purpose of selecting one better adapted, for the offices and public building of the Company." Although the copy of this letter, if it be not the original, is unsigned, there can be no doubt that it was written by Galt, or at his dictation, and that the directions contained therein were followed out by Dunlop; for on St. George's Day—April 23rd, 1827—Galt, accompanied by Dunlop and Mr. Prior, and attended by two woodsmen, walked eighteen miles through the forest and founded the city of Guelph. The long tramp was lengthened by the party getting lost in the woods. It came on to rain and they were all soaked to the skin. "By this time the sun had set, and Dr. Dunlop, with his characteristic drollery, having doffed his wet garb, and dressed himself in Indian fashion in blankets, we proceeded with Mr. Prior, attended by two woodsmen and their axes." A maple tree was felled with considerable ceremony, Galt striking the first blow with the axe. Dr. Dunlop and Mr. Prior each then struck a blow and the woodsmen completed the felling of the forest giant. Galt says, "To me at least the moment was impressive—the silence of the woods, that echoed to the sound, was as the sigh of the solemn genius of the wilderness departing forever." He goes on to say that "after the tree fell there was a funereal pause....; it was, however, of short duration, for the Doctor pulled a flask of whiskey from his bosom, and we drank prosperity to the City of Guelph." It may be said in passing that this was not the last time that the Doctor, in similar fashion "saved the situation." They then returned to York.

As soon as Yonge Street was passable, Galt and his party, unaccompanied by Dunlop, proceeded to Lake Simcoe, and thence to Penetanguishene by way of the road opened in the winter of 1814-15, as previously related. The party sailed around Cabot Head, and down Lake Huron in a small British gunboat, examining the shore as they passed, until on the afternoon of the following day they "met a canoe having on board a strange combination of Indians, velveteens, and whiskers, and discovered within the roots of the red hair, the living features of the Doctor." He piloted them into the harbour of what is now Goderich, and they dined sumptuously in the log cottage of their host, where they passed the night. History does not record the various comestibles with which the good Doctor regaled his distinguished guests, but it does relate that he produced a bottle of champagne, the mate to the one which figured on the occasion of the midnight refection already described.

The years that followed were filled with days and nights spent tramping the woods; building roads and bridges; clearing the land; writing articles for magazines, including the Canadian Literary Magazine of York, and the Literary Garland of Montreal; the publication of his "Statistical Sketches of Upper Canada," his "Defence of the Canada Company" (1836); his occupancy, with his brother, of the estate he had taken up in Colborne across the river from Goderich; his unrealized plan for a town or village upon it, of which an accurate, and unique plan was drawn up; the marriage of his brother Robert to the housekeeper, Louisa McColl, the result of a flip of a double-headed penny; the building of Gairbraid House, with its mahogany table, heavy chairs, and last but not least the celebrated liquor traveller, with the Twelve Apostles; the trips to York and Toronto; the founding of the Toronto Literary Club and Mechanics' Institute; the ambitious scheme for a Natural History Museum, with zoological and botanical gardens, for which land near the Barracks was set aside, Mr. Fothergill and Dr. Rees being his associates; his interest in the founding of St. Andrew's Presbyterian Church at the corner of Adelaide and Church Streets; his visits to England in the interest of the Company; these, and a hundred other activities, fill up the eventful years and bring us up to the year of the rebellion of 1837.

During this period, many changes had taken

place within the organization of the Canada Company. In 1829, John Galt had been relieved of his appointment. He considered himself much wronged by his dismissal, and his later years were embittered by the sense of injustice which he felt as a result of the action of the Company. One can but guess as to his qualifications for such an important mercantile appointment. He was a writer of note, the friend of poets, of novelists and of the most brilliant literary critics of the day; he had some training in business, and in law; but from what I can learn, he had had little experience as an organizer and administrator. Anyhow, he failed to please his absentee directors, and Thomas Mercer Jones reigned in his stead. In fairness to Galt, it must be said, that his recommendation to the Directors were often disregarded, and that others reaped where he had sown. He and his Warden of the Forests were largely responsible for the increase in population of Upper Canada, during the years 1826 to 1830, of over fifty thousand souls.

With a break or two, Dunlop continued with the Company for some years. Mention may be made here of the home which he created for himself and the Captain. The tract selected by the brothers was perhaps one of the most picturesque in the country. At the point on the right bank where the Maitland River turns to the west, to enter the lake some mile or two further down, the high road strikes due north, running roughly parallel to the shore of the lake. On the west side of this road, on the high bank of the river, the Tiger was granted 440 acres; while on the east, directly opposite, his brother, Captain Robert Graham Dunlop was allotted 410 acres, the two parcels forming a demesne of nearly two square miles, which they named Gairbraid, in honour of their mother's home in Scotland. The prospect from Gairbraid was most impressive. To the south, a long reach up the river presented a striking vista of wildwood and stream, while the turn in its course to the west permitted the eye to follow it between wooded hills until lost in the illimitable blue of Huron. Changed as is the landscape today, one cannot look upon it unmoved. Here the brothers built their house which was to be the nerve-centre of many public activities, and the scene of many social gatherings, and open-handed hospitality; and here for them was to be "Journey's End."

The cutting of the road, twelve feet wide, from what is now Stratford to Goderich, was probably the greatest factor in opening the country, giving access to Ancaster, Hamilton, York and points east. Until this road was built, everything and everybody entered the tract from Goderich.

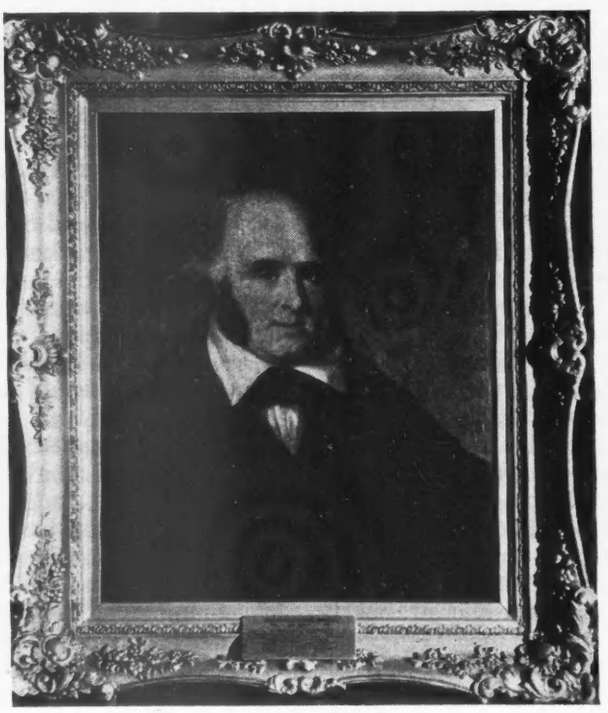
The year 1837 saw the rebellion in Upper and Lower Canada. Few persons nowadays realize what hardships and losses the people suffered as a result of this ill-advised action on the part of men who despairing of attaining their ends by constitutional means appealed to arms. There can be no doubt that both in Upper and Lower Canada, complete independence and separation from the mother country was the objective of the insurgent leaders and their associates. The same abuses, which existed in Nova Scotia and New Brunswick were abolished by constitutional means, without bloodshed or hangings.

When the call to arms came, Dunlop was asked to raise a regiment of volunteers, which he promptly did, with the backing or enlistment of nearly every man of military age in the Tract. Huron was loyal, and "The Tiger" was the man to lead these sturdy pioneers and their sons. The Doctor was appointed to the command of the 1st Huron Regiment, and again put on the uniform of his Soverign. It may be noted here that he had maintained his connection with the army until 1828, when, for having left England without permission, when he came to Canada with Galt in 1826, he was struck off the half-pay list of the British Army. The regiment was organized into a defence force on the St. Clair frontier, and, while they saw no actual fighting, suffered a good deal during the winter of '37-'38 from poor food and bad billets—or sometimes no billets at all. Sickness was rife, and there was little provision made for taking care of the sick, "The hearty, cheery spirit of Dunlop, who doubled the rations, was better than medicine, or even than his liberal allowance of grog. When they moped he would order them out for a march, leading them in his homespun checkered dress and Tan O'Shanter, closely followed by the Fords ('Sons of Anak', because they were all six feet six), the Youngs, the Annands and other stalwart township pioneers." In addition to the hardships endured, no pay was forthcoming. Things got so bad at last that Dunlop resigned his commission, but continued his fight for his men. After weeks of protesting, negotiating, browbeating and what not, the money was placed in the Bank of Upper Canada at Amherstburg. Here Dunlop and his friends waited for five days before the money could be got out of the bank. The long journey by the lake shore to Goderich was begun, and after days of hard tramping through slush and snow, and some days spent on the lake in a dugout canoe, the money arrived at Goderich and the men were paid off, and returned to their neglected farms and destitute families. Dunlop's address to his gallant Hurons is preserved in print and is a masterpiece. It is too long to introduce here, but may be read in the "Humours of '37", by the Misses Lizars.

The first election in Huron was held in 1836 and resulted in the election of Captain Robert Dunlop, who was re-elected in the following year. He served until his death in 1841, and was succeeded by his brother, the doctor. During the latter's short parliamentary career he was very popular, both on account of his congenial nature and eccentricities, and the entertaining character of his speeches. Forceful, if not eloquent, he always filled the House when he spoke. During the session the question of levying new taxes was under discussion, when one of the members, who was a bit of a wag, interrupted Dunlop with the

question, "Would the honourable member advocate placing a tax on bachelors, as such?" "Certainly," retorted the doctor, "I believe all luxuries should be taxed." In 1846 he resigned his seat in parliament, upon accepting the appointment of Superintendent of the Lachine Canal. Whether or not in accepting this post, he realized that his strenuous days were behind him, we have no means of knowing. In less than two years, the strong man was laid low. He sent for Lou, the widow of his late brother, who came at once and tenderly cared for him through the long summer. Near the spot where he had received his first military appointment in Canada, thirty-five years before, on the 29th day of July, 1848, at Cote St. Paul, he joined the innumerable caravan, and Huron and Gairbraid knew him no more forever.

He had always said he wanted to be laid beside his brother, and his sister-in-law carried out his wish with the same degree of faithful devotion she had always shown the brothers. The heat of a Canadian summer made it imperative that the remains be interred at Hamilton. The following January, however, saw Lou and two men, with a team of good horses and a sleigh, back in Hamilton; the long journey homeward was taken; and the wanderer at last rested with his own people.



WILLIAM DUNLOP ESQ., M.R.C.S.
1792 1848
"THE TIGER"
ASSISTANT SURGEON 89TH REGIMENT
LOWER CANADA, NIAGARA FRONTIER, 1813-14; INDIA, 1815-20
LECTURER IN MEDICAL JURISPRUDENCE, UNIV. OF EDINBURGH
WARDEN OF THE FORESTS, CANADA COMPANY
LIEUT.-COLONEL 1ST HURON REGIMENT, 1837
COMMISSIONER OF THE PEACE, LONDON DISTRICT, 1838
M.P.P. FOR HURON, PARLIAMENT OF CANADA, 1841-45
LITTERATEUR, COLONIZER, PATRIOT.
PRESENTED BY MRS. J. M. MUSSEN.

William Dunlop, as has been noted, was a man of gigantic stature. He had a shock of red hair, much thinned at the top as he got older; kindly blue eyes that shone with humour; a well shaped mouth, small for so large a man; high forehead and firm chin, with mid-mental cleft, or what in the female would be called a dimple; thick side-whiskers, or more properly "sideburns," which extended below the angle of the jaw. In early life, his clothes were ill-fitting, perhaps because they had been made for a smaller man; later he hay have improved, and his picture in "Maclise's Gallery of Illustrious Literary Characters" shows a well dressed, handsome man; but it is recorded that Lou, his sister-in-law, was always much exercised over his disregard for the niceties of dress, and did her best to keep him decently clad, and "respectable" in his outward appearance. In Canada he nearly always wore the native homespun and Scotch bonnet.

At the time of his death three portraits of the doctor are known to have existed. There was the well known engraving in Maclise's "Gallery of Illustrious Literary Characters;" a handsome miniature on ivory made when he was apparently about thirty-five years of age; and the large portrait in oils which has been presented to the Academy. The first is an exceedingly fine sample of line engraving, so popular at the period, and has been reproduced many times. The miniature was an exquisite bit of painting, and was much admired in its day, as no doubt it would be in this, had it survived; but an energetic house-maid, thinking to brighten it up, scrubbed it with soap and water. When she had finished, nothing was left but the ivory. There is a halftone reproduction of this miniature in the Misses Lizars's book.

Kind-hearted and generous to the point of unthrift, a convivial, not to say extravagant liver, like all men of his time, drinking more than was good for him, but doing it as the genial host or as a welcome guest; witty and fond of ruthless practical jokes; a biting tongue and pen upon occasion; religious to the extent of having a deep respect for the church of his fathers, and of *living* his religion by deeds, not words; unselfish and honest; tender in all his dealings with children, women and the infirm; such was this son of the heather whose career I have attempted to sketch. Devoted to his King, and no less so to his neighbour, if worthy, he helped many to affluence, and died without wealth himself. Deservedly popular in the community in which they lived, both he and his brother continued to represent Huron in parliament until the death of the one, and the resignation of the other. To merit and to receive the confidence and respect of those with whom one lives on the intimate

terms of neighbour is high tribute to the worth of any man or woman; and these the Captain and the Doctor continued to hold to the end of their days. If I have frequently referred to his convivial habits, I did so in order that this man may be shown to have been a man among the men of his day. Like Robert Burns and the majority of the men of the period, and later, he was a drinker, but no drunkard. That these men drank more than was good for them, no one now doubts. It was the custom, and custom is at the back of many of our laws. Their limitations, if they be limitations, serve but to throw incense upon their altar, and provoke a brighter flame. They were heroic in type, and the present age could use men of the same stripe and fibre. Such men sent Britain's drum-beat echoing around the world; such men are needed today to sound for us the reveillé. Far from the sunset glories of Huron, in the capital of the misty land of his birth, a noble bronze, in a nobler shrine, perpetuates the memory of another of his race, whose requiem might well be added to the epitaph at Gairbraid.

"Under the wide and starry sky,
Dig the grave and let me lie,
Glad did I live, and gladly die,
And I laid me down with a will.

This be the verse you grave for me,
Here he lies where he longed to be,
Home is the sailor, home from sea,
And the hunter home from the hill."

Association Notes

THE VANCOUVER MEETING JUNE 22-26, 1931

The Sixty-second Annual Meeting of the Canadian Medical Association was held in Vancouver on June 22nd and successive days. Notwithstanding some forebodings arising out of the present depressing financial situation and the fear that distance also would prove a deterrent, the meeting was an unqualified success. It had been hoped, somewhat wildly, it was thought by some, that there might be an attendance of 400. Actually, more than 500 doctors registered, and 260 ladies. This was highly gratifying to the President, Dr. Monro, and the Local Committee, and, indeed, to all members of the Association. It speaks well, also, for the efficiency and devotion to their task of all those in charge of the arrangements that everything passed off harmoniously and without a hitch. The thanks of the membership of the Association as a whole are due to the Vancouver brethren for their splendid work and genial courtesy, and will be heartily accorded. Only the Weather Man was unpropitious, but it took more than a little rain to dampen the ardour of the visitors and their hosts. We would have preferred fine weather, but we had a good time as it was.

A full report of the business transacted, with relevant discussion, will appear in the September issue of the *Journal*. Suffice it for the present to touch upon the "high spots" of the convention. The Executive Committee and the Council met on June 22nd and 23rd, and dealt with a large docket of business in a business-like way, and without waste of time. Among several subjects of great importance two or three stand out preeminently. These are certain phases of Medical Economics, such as Health and Maternity Insurance, and Charity Practice, referred to in Dr. J. H. MacDermot's report; A Basis of Approval for Internship of Hospitals in Canada; the Post-Graduate Courses; and an attempt at better interprovincial relations, as outlined by Dr. J. S. McEachern.

We are glad to be able to state that the Council went on record "as recommending that the Canadian Medical Association take steps to form, in connection with its committees on Economics and Public Health, a strong and carefully selected study-group which shall consider the question of Health Insurance, and shall examine into all voluntary and compulsory schemes, and be prepared to submit constructive proposals to the Association." At a later meeting of the Executive this matter was referred to the Chairmen of the Committees on Public Health and Economics, requesting them to submit names to form a study group, according to the idea expressed in the resolution.

Dr. G. Harvey Agnew, of the Department of Hospital Service of the Association, reported that the "Basis of Approval for Internship of Hospitals in Canada" has been completed, printed, and distributed to the various hospitals in Canada. We learn that this "Basis" has been received with general approval, and that a subcommittee has been appointed to appraise the Canadian hospitals accordingly.

The Post-graduate Tours came in for commendation from all parts of Canada and the general opinion is that they are of the greatest value in bringing the latest advances in Medicine to those who, otherwise, would find it difficult, if not impossible, to learn of them in a practical way. Gratitude was everywhere expressed to the Sun Life Assurance Company of Canada for its generosity in making these post-graduate courses possible.

Dr. J. S. McEachern, in his report on Interprovincial Relations, felt that not enough was being done to strengthen the relations that exist between the various provinces in matters medical, and between the Provincial Associations and the National Association. His views commanded serious attention, and he was asked to state them in form and present them to a later meeting of the Executive for action. All will hope that the relations between the provinces may in time be made stronger, so that a fuller measure of concerted action on important matters may be thereby made possible.

The general sessions began on the 24th, and the Convention was formally opened by an evening meeting, at which the Premier of British

Columbia, the Hon. S. F. Tolmie, in a bright and witty speech conveyed the welcome of the Province to the visitors. This meeting was also rendered notable by the fact that at it the first Blackader Oration in Pædiatrics was delivered by Dr. E. A. Park, Pædiatrician-in-Chief of the Johns Hopkins Hospital, who took as his subject "Rickets". Dr. Park's Oration was a scholarly and masterly effort, his various points being illustrated by many excellent lantern slides, and he was listened to with marked attention. We expect to present this address in the *Journal* shortly. Dr. Blackader, who was, to his great regret, prevented from being present, had sent a letter expressing his appreciation of the honour of having an oration named after him and stating he believed that this was the first time that an oration relating to pædiatrics had been instituted. Dr. Blackader's letter was read by the Chairman, Dr. A. S. Monro, and was much appreciated by the audience. Dr. Park, in introducing his subject, paid a graceful tribute to Dr. Blackader for his great services to the profession, and to pædiatrics in particular.

This meeting was also rendered notable by the fact that Dr. Primrose, on behalf of Dr. John Ferguson, of Toronto, who was unable to be present in person, presented the beautiful presidential chain of office donated by Dr. Ferguson to the Association, and invested the out-going President, Dr. Harvey Smith, with it. Dr. Smith wore his chain for, perhaps, half a minute, and then passed it over to Dr. A. S. Monro, thus formally installing him as his successor in the presidency. Dr. Monro acknowledged this in suitable terms.

The Public Meeting, held on the evening of June 23rd, was largely attended, both by the medical men and the laity. Great interest was evinced in the addresses, which were of practical import. Dr. Douglas Quick, of New York, spoke on "Cancer"; Dr. D. A. Stewart, of Ninette, Man., on "Tuberculosis"; and the Hon. Dr. F. D. Munroe, Minister of Health for Saskatchewan, on "The Dominion Cancer Problem".

The scientific papers, read at the general sessions, were of high quality.

Two new sections were inaugurated, that on Historical Medicine, and that on Military Medicine. In the former Dr. M. W. Thomas, of Victoria, read a paper on "Medical Pioneering in British Columbia", and Dr. G. E. Darby, of Bella Bella, spoke on "Medicine and Surgery among the Indians of the British Columbia Coast". The excellent attendance and the great attention paid to the speakers augurs well for the success of the new section and was highly gratifying to those members of the profession who are interested in the history of their craft. In the Section of Military Medicine the inaugural address was given by Col. J. T. Clarke, D.G.M.S., of Ottawa, and was discussed afterwards in Round Table conference. The attendance at this Section was also gratifying.

On the matter of entertainment it is hard to speak with restraint. Our hosts and hostesses of Vancouver were kindness itself. Lunches, dinners, excursions, drives, were the order of the day. On the one afternoon it did not rain the excursion to Howe Sound, provided by the generosity of the Vancouver City Council, was entirely delightful, and gave the opportunity for enjoying some wonderful scenery. The Horse Races provided also much entertainment, and, it was reported, some pecuniary aggrandisement for certain of the visitors. Not all were good judges of horseflesh, however' The luncheon for the ladies at Grouse Mountain Chalet was most pleasant, despite the rain. Mrs. B. T. Rogers' Garden Party was delightful, and many of her guests, armed with umbrellas and waterproofs, braved the elements to view her wonderful garden. To all who entertained the visitors return their most hearty thanks. Most of the visitors hope that there will be another meeting of the Association in Vancouver before many years.

Next year the Association will meet in Toronto, under the presidency of Dr. A. Primrose, and in 1933 it is expected that it will meet in Saint John, New Brunswick.

THE PRESIDENTIAL BADGE

The accompanying picture gives some idea of the appearance of the new Presidential Badge, so generously presented to the Association by

Dr. John Ferguson, of Toronto, a Past President of the Ontario Medical Association, and a Nestor of the medical profession in this country. It, however, fails to do justice to what is a most excellent piece of craftsmanship. The badge is in the form of a chain with medallions and is worked in solid gold. The large medallion, constituting a sort of pendant, has upon it the figure of Hygeia, with the words "Canadian Medical Association founded 1867" and "Praesidis Insigne." The shields bear the arms of the different provinces of the Dominion. The smaller medallion has the caduceus with the serpent. The upper portion of the chain is composed, appropriately, of maple leaves, and the whole depends from a red ribbon. The badge is of Canadian workmanship, having been designed and executed by Ryrie-Birks, of Toronto. It was a matter of great regret to those present when the Badge was presented that Dr. Ferguson was unable, owing to the serious illness of his wife, to be present in person. Dr. Ferguson has the grateful thanks of the whole Association for his timely, appropriate, and altogether charming gift, and all will join in the hope that Mrs. Ferguson will speedily be restored to health.

Hospital Service Department Notes

THE CHANGING STATUS OF THE VOLUNTARY HOSPITALS

The position of the Voluntary Hospitals in England is causing considerable concern to those responsible for their operation. The elevation of the status of the Council Hospitals, placing them upon a competing basis with the Voluntary Hospitals in the type of professional work done, and relieving them of much of the financial responsibility, always such a burden to the Voluntary Hospitals, has materially added to the difficulties of maintaining the latter upon the original basis of foundation, that of devoting practically all of the work of the hospital towards providing free medical and hospital care to those who cannot pay. Private patients have to a large extent gone to nursing homes. Of course medical service has been voluntary and, as Mr. A. H. Leaney of Birmingham, the Chairman of the Council of the Association of Hospital Officers, said at the recent Public Health Congress in London, "It is generally believed that, if, through some unfortunate circumstance, the medical staff should be compelled to accept payment for its services, the voluntary system would fall into ruin."

At the present time the Voluntary Hospitals are being obliged to change some of the aspects of their work. As Prof. Hey Groves stated in his Harveian Lecture, "The voluntary system has now changed its character . . . . . only a portion of the funds can now be described as the product of free will . . . . . most of the patients have to pay a contribution towards their maintenance, and an increasingly large number have their entire maintenance provided by a contributory insurance scheme." Also as pointed out in "*The Hospital*" there is a distinct tendency for the voluntary hospitals in London to devote an increasing amount of space to private patients. Westminster, West London, and King's College are among those which have recently announced further developments in that direction, while the Cheyne Hospital for Children has made a new departure in providing accommodation at a cost of three to five guineas a week for children who require a lengthy period of treatment. "Some people seem to think that the financial salvation of the Voluntary Hospital lies in this direction though it involves a wide departure from the original objects of their foundation. The London County Council clearly intend to carry out their obligation to provide for those who cannot provide for themselves, so that their policy also tends to drive the Voluntary Hospitals to become nursing homes on a large scale."

HOSPITAL FIRES IN 1930

The serious danger of fire existing at present in so many of the public institutions of Canada is emphasized in the report of the Dominion Fire Commissioner, Mr. J. Grove Smith, of Ottawa, to the Association of Canadian Fire Marshals and the Dominion Fire Prevention Association. During the year 1930, under the heading of Hospitals, Sanatoria and Homes, sixty-six fires were reported, with a monetary loss of $148,966. The number of deaths is not shown, but, fortunately, very few deaths have occurred in hospitals fires in Canada during the past few years. However, many hospitals in this country are very poorly equipped for fire emergencies, especially with respect to facilities for the rapid removal of bed patients and the following comment of the Fire Commissioner is very appropriate:

"One question of major importance at present confronts all those interested in the protection of life and property from destruction by fire. While, in 1930, Canada has been fortunate in the number of fatalities occurring in public buildings, the hazard is so pronounced in vast numbers of institutions that steps to effect betterment must immediately be taken if serious future calamities are to be avoided. During the past ten years, 601 persons have been burned to death in public and institutional buildings in Canada and 871 others have been seriously injured. Throughout this period, the authorities responsible for the administration of institutional buildings have constantly been urged to action. Vague promises have been made but, with few

exceptions, little has been done, and the conclusion must be reached that the authorities are either too financially embarrassed or too personally indifferent to give the matter adequate consideration. The excuse invariably offered is that the majority of buildings are equipped with external iron ladder fire escapes in compliance with legal requirements, and that this absolves the local administration from all responsibility. Experience demonstrates that such escapes are a menace rather than an aid to the exit of children and bed-ridden persons from burning buildings. Until government requirements provide for a more effective substitute, the hazard to life and limb in the event of fire will continue unabated."

THE MANITOBA HOSPITAL ASSOCIATION

One of the best conventions ever held by the Manitoba Hospital Association took place in Portage La Prairie during the month of June. Nearly all of the hospitals were represented, in many instances by members of the medical staff. The hospitals of this province are feeling the economic pinch to a marked degree and many are finding it difficult to carry on. Not only are collections from patients reduced, but it is exceedingly difficult to collect from the municipalities, many of which are unable to collect their taxes. The increasing use by the medical staffs of the radiological, laboratory and other services in the care of indigent patients has added to the difficulties of the hospitals, for these "extras" are not recognized by the province nor by the municipalities. It is becoming ever more obvious that a widespread campaign of public education concerning the administrative and financial problems of hospitals will be necessary.

A number of interesting questions were raised during the Round Table Conference conducted by Dr. George F. Stephens of Winnipeg. The question of the exposure of nurses to tuberculosis infection was handled by Dr. E. L. Ross, of Ninette, who was of the opinion that the increase in tuberculosis among nurses may be due in part to the earlier age of entrance and to the decreased exposure in childhood, thus reducing acquired immunity. The diagnosed case in the sanatorium is seldom, if ever, a factor, although the undiagnosed open case in general hospitals is a distinct menace. The moral and legal necessity for treating hospital records as confidential information was emphasized by Dr. O. C. Trainor, of Winnipeg, and several lawyers present. Unless the patient gives consent, or the doctor assumes full responsibility, the records should not be open (except for impersonal scientific tabulation) to anyone not armed with a subpœna. The rights of trustees to deny hospital privileges to unethical physicians elicited some discussion.

Dr. S. Schultz, of the Department of Health, pointed out the wisdom of not relying entirely upon pasteurization in safeguarding the milk supply. The Deputy Minister of Health, Dr. F. W. Jackson, outlined the hospital requirements for rural areas and Dr. Harvey Agnew gave the address at the Annual Dinner on "Health evolution and the hospital of tomorrow."

The meeting was ably handled by the retiring vice-president, Miss C. N. McLeod, R.N., of Brandon, and the incoming president, Mr. J. H. Metcalfe, trustee of the Portage La Prairie General Hospital. The popular secretary, Dr. G. S. Williams, of the Children's Hospital, and the treasurer, Dr. Dougald McIntyre, of the Municipal Hospitals, Winnipeg, were re-elected.

Medical Societies

THE AMERICAN DERMATOLOGICAL ASSOCIATION

The American Dermatological Association met in Toronto on June the 15th, 16th and 17th. This is the first meeting of the Association held in Canada during the past thirty-six years. The attendance was the largest in the history of the Association, seventy-five being present.

A clinic was held at the Toronto General Hospital—forty cases being shown by Drs. King Smith, E. J. Trow and H. A. Dixon. Dr. King Smith was chairman of local arrangements. Dr. E. J. Trow was elected a member of the Association.

Some of the papers read were:— "The pathology of the yellowing dermatoses," Fred D. Weidman, Phila.; "Fatal ioderma," Jos. J. Eller, New York; "Generalized scleroderma in children," E. L. Oliver, Boston; "Studies on the superficial lymph glands in early syphilis," H. E. Michelson, Minneapolis; "Trichostasis spinulosa," J. F. Burgess, Montreal; "Studies in the chemotherapy of ringworm infection," Jay F. Shamberg, Phila.; "Cephalosporiosis," Howard Morrow, San Francisco.

THE BRITISH COLUMBIA MEDICAL ASSOCIATION

The annual meeting of the British Columbia Medical Association was held at the Hotel Vancouver, on Tuesday, June 23rd, concurrently with the Canadian Medical Association meeting. The afternoon was devoted to business, when the retiring President, Dr. G. L. Hodgins, gave a summary of the Association's activities during the past year. Following the reports of committees the following officers were elected:—

President, Dr. Thos. McPherson, Victoria; *President-elect,* Dr. W. J. Knox, Kelowna; *Vice-president,* Dr. D. Corsan, Fernie; *Hon. Sec.-Treas.,* Dr. D. E. H. Cleveland, Vancouver. *Members of the Executive,* Drs. C. S. Williams, Trail; J. M. Fowler, Victoria and G. W. Sinclair, New Westminster.

In the evening the annual dinner was held, at which the Council of the Canadian Medical Association were guests. Dr. Ward Woolner, of Ayr, Ontario, spoke interestingly on medical economics. Other guests at the dinner included the Presidents of the Dental Society, the Hospitals Association, the Professional Engineers and the Law Society.

THE CANADIAN PUBLIC HEALTH ASSOCIATION; THE SASKATCHEWAN HEALH OFFICIALS' ASSOCIATION

The twentieth annual meeting of the Canadian Public Health Association and the fifth annual meeting of the Saskatchewan Health Officials' Association were held in Regina on June 17, 18 and 19. The morning meetings were held in four sections, namely, vital statistics, laboratory work, public health nursing, and mental hygiene; in the afternoon one general meeting was held.

In his address "The challenge of tuberculosis," Dr. David Stewart, of Ninette, Manitoba, said that the incidence of tuberculosis in a community was an incidence of its civilization. If that be true, then Saskatchewan is the most civilized Canadian province, as it has the lowest tuberculosis death rate. He also mentioned the high incidence of tuberculosis among nurses in training. In Saskatchewan in 1929 nine nurses in training were admitted to sanatoria and twelve stenographers.

All of the provincial public health nurses attended the sessions. Miss Cotter came from far away Cumberland House; a long lap of her journey was made by canoe. The public health nursing section began on time and ended on time. It was noted for the absence of long, drawn-out papers. Among the notable speakers in that section were Miss M. McCuaig, Western Supervisor of the Victorian Order of Nurses, on "A pre-natal program for a rural area"; Dr. J. W. MacNeill, Commissioner of Mental Services, Saskatchewan, on "A mental hygiene program"; Mr. David Russell, B.Sc., University of Saskatchewan, on "Child guidance clinics"; and Miss Emma deV. Clarke, Division of Mental Hygiene, Department of Public Health, Toronto, who sent a paper on "The public health nurse in the mental hygiene field."

Dr. J. G. Fitzgerald, Director of the Connaught Laboratories and School of Hygiene, University of Toronto, addressed the general meeting on "The problem of immunization". He was one of the few speakers who did not read from a typed manuscript which made it pleasant for his hearers.

Ten of the fifty-eight addresses given at the sessions dealt with mental hygiene. This is significant of the modern trend to pay more attention to the mind. "Adjustment to environment," "Motivation of activity", "Repressive symptoms", were phrases which hovered and floated about the meetings.

During the sessions the weather was at its worst, high temperatures and higher winds bearing thick clouds of summer fallow obscured the sun. Whether to open the windows and choke or to leave them closed and suffocate was the question; however, it gave the visitors a good chance to understand some of the mental problems confronting the prairie housewife.

One of the delightful social events was a reception given by His Honour Lieutenant-Colonel Hugh Edwin Munroe, M.D., F.A.C.S., O.B.E., Lieutenant-Governor of the Province of Saskatchewan, and Mrs. Monroe at Government House.

THE MIDDLESEX MEDICAL ASSOCIATION

The regular meeting of the Middlesex Medical Association, through the courtesy of Drs. W. J. and H. A. Stevenson and Miss Annie Stevenson, was held at their country place at Pond Mills on the afternoon of Wednesday, July 15th, at 3 o'clock. The program was as follows:—

1. Business meeting: (a) Reading and disposal of minutes; (b) election of a member to the Historical Committee of the Ontario Medical Association; (c) proposals for, and election to, Life Memberships; (d) correction of our Medical Directory.

2. "Medicine and its co-dependents," Dr. Angus McLean, Detroit, Mich.

3. Short addresses by Drs. W. J. and H. A. Stevenson.

4. Refreshments.

The house where the meeting took place is surrounded by a veritable maze of shrubbery which encloses perennial borders, a rose garden and a formal garden and shows some pleasant vistas and beautiful views. There were facilities for swimming, of which members of the party availed themselves after the program.

University Notes

University of Liverpool

Dr. H. Leith Murray, M.D., Aberdeen, F.C.O.G., has been appointed to the chair of midwifery and gynæcology in succession to Prof. W. Blair Bell.

McGill University

An added link in the traditional chain of friendship between McGill and the universities of the Old Country was forged in April by the decision of the Senate of St. Andrew's University to confer an honorary LL.D. degree upon E. W. Beatty, Esq., Chancellor of McGill and President of the Canadian Pacific Railway. In both capacities Mr. Beatty commands respect in the British Isles, commensurate with that accorded him in Canada, and the announcement from the Senate of St. Andrew's will be received throughout Great Britain and Canada with whole-hearted approval.

Since it was announced in the spring that a reunion of McGill graduates would be held in Montreal this autumn, committees have been hard at work, and a program for the days from October 14th to 17th has been announced.

Registration of visiting graduates will take place on the morning of Wednesday, the 14th; the Reunion Convocation of the University will be held in the afternoon, and a smoker will be given that night.

Lectures and clinics will be given on October 15th, and buildings will be open all day for inspection. A reception will be held on the Campus in the afternoon; and golf will be arranged for those wishing to play. A dance will be held in the evening.

October 16th will be marked in the morning by the annual meeting of the Graduates' Society; in the afternoon by the Intercollegiate Track Meet; and in the evening by a McGill reunion banquet. A luncheon to past officers of the McGill Union will celebrate the 25th anniversary of the Union's inauguration.

The morning of October 17th is left as an open date; but in the afternoon the Percival Molson Memorial Stadium will be filled to overflowing for the pleasure of witnessing Varsity vs. McGill. As usual, after the Toronto football game, class and fraternity dinners will be held, and these will bring the official reunion program to a close. Adequate preparation for the entertainment of all graduates is being made, and the reunion gives promise of attaining success even more marked than that which attended the famous gatherings of five and ten years ago.

Already the Committee in charge of the reunion arrangements have heard from a number of far-away graduates who plan to attend the celebrations in October. No estimate of total attendance can yet be made, but it is hoped that all records will be broken, and that McGill may have the privilege of welcoming back a host of her graduate sons. To all of these, however far they may have wandered, the assurance of a warm welcome is unreservedly extended.

Oxford University

It was proposed in Convocation at Oxford on June 25 that the honorary degree of Doctor of Civil Law be conferred by diploma on the Duchess of York. It is hoped that the Duchess will be able to be present in the Sheldonian Theatre at Convocation on October 22 to receive the diploma. On the latter date she has consented to visit Oxford to open the new maternity home at the Radcliffe Infirmary, the gift of Sir William Morris, which has been built at a cost of £40,000.

Special Correspondence

The London Letter

(From our own correspondent)

The most important medical events of last month in London were undoubtedly the celebrations attendant upon the centenary of the Harveian Society of London. These can be described under three headings. First came the meeting at Harvey's old hospital and there was a large gathering at St. Bartholomew's to hear Dr. Raymond Crawford's stimulating address on the place of medical societies in the progress of medicine. The Harveian Society of Edinburgh was represented at the meeting, while Professor Welch, from Johns Hopkins, represented the Harveian Society of New York. The second event was the centenary dinner in the hall of the Grocer's Company in the City of London where a truly magnificent occasion moved Professor Welch to remark—"You do such things well in London". The dinner was given by Mr. Buckston Browne, whose generous hospitality on this occasion is by no means his first benefaction to the medical profession. The third ceremonies were grouped round the pilgrimage to Harvey's tomb at Hempstead in Essex. The Bishop of Colchester gave the address and subsequently blessed a beautiful silver paten to be used with the Elizabethan chalice belonging to the church. The Harveian Society has undertaken the reconditioning and rehanging of the church bells when the tower is rebuilt, for which latter object, it will be remembered, an appeal

to the medical profession throughout the English-speaking world was launched sometime ago.

Sir Ernest Graham Little has now set out, in a closely reasoned letter, his views on the "Osteopaths Bill", recently withdrawn from Parliament and mentioned in these notes some months ago. He makes it abundantly clear that behind this attempt at securing registration of osteopaths in this country was a strong campaign directed from across the Atlantic, where, according to his letter, the osteopathic calling has "felt the draught", and was turning its attention to the British market. It is undoubted that these revelations will successfully kill the agitation in this country, and a further positive move towards ridding the public and medical profession here of quackery in certain forms of physical treatment has been taken by the Society of Apothecaries in establishing a register of bio-physical assistants. In a recent "At Home" held for the bio-physical assistants now on the roll of the Society, the need for such a register and the manner of its organization was explained. The Society of Apothecaries has established an organization for the teaching and examination of those intending to practise as physio-therapeutists and there are already over 1,000 names on its roll. It is proposed in the future to educate both the public and the medical profession as to the value of all forms of physical medicine, with post-graduate lectures, etc. It is further hoped to bring influence to bear upon the big general hospitals to set aside beds for cases under special treatment by physical methods, and it may be possible to establish a museum at the Apothecaries' Hall where antique and modern apparatus can be made accessible for study. It was also urged that a special committee should invite and scrutinize articles for publication in the lay and medical press. It should be realized that there has been no attempt at legislative measures so far and the new register has no exclusive power, so to speak, but it should eventually go a long way towards cleaning up this happy hunting-ground of quack-treatments.

When the authorities at the Middlesex Hospital decided, some two years ago, to break the tradition of decades and let their patients sleep in the morning until a reasonable hour instead of being wakened for a bureaucratic wash-and-brush-up at 4 a.m., or even earlier, there were many sorrowful waggings of the head in Matrons' offices up and down the land. However, public opinion applauded this new movement and several other authorities decided that the matter deserved investigation. King Edward's Hospital Fund for London has now circulated a special report on this subject, so far as London Voluntary Hospitals are concerned. The matter is not so simple as appears at first sight, for it is forgotten by many of the "later-waking" supporters that work closes down in a hospital long before the hour at which patients are accustomed to go to bed when at home and if patients are able to get off to sleep at 8 p.m. there is some reason for making the breakfast hour 6 a.m. Also, it must be borne in mind that when, say, thirty patients in one ward have to be wakened and washed the necessary attentions must be individual and with a limited night-staff this means that someone must be wakened early if the last patient is to be ready by the time of the official visits of the day. However, the shortage of staff, it is urged, should not be allowed to rule out any consideration of the question. The report has as its fifth recommendation "that, whatever the official hours may be, no patient should be washed before having either breakfast or early morning tea." This has already occasioned an indignant letter in the lay press to the effect that the writer *always* washed before breakfast and hopes the poor patients will not be denied this necessary and hygienic attention. So the path of the reformers, as usual, is not altogether roses all the way.

At a time when labour troubles are causing anxiety in all parts of the world and the workman is coming in for a considerable amount of abuse it is fitting that the public should be reminded of the risks run in certain occupations. Prof. E. L. Collis chose "The Health of the Coal-miner" as his subject for the recent Chadwick Public Lecture, and he showed how the conditions under which the miner worked were responsible for the disabilities he earned. Miners' nystagmus —with its all important psychological factor— costs the mining industry about a million pounds a year, and other disorders such as "beat knee", "beat hand", and "beat elbow", and inflamed wrist also cause a great amount of lost time. The modern machines for rock-cutting have increased the pulmonary disorders due to inhalation of dust, but a device has now been invented for capturing the dust as it is generated. It is important to observe that the miners tend to be most dissatisfied with their working conditions in those coalfields where the mortality rates are highest, and there is no doubt that better working conditions are essential in any modern scheme of rationalization.

ALAN MONCRIEFF.

London, July, 1931.

The Edinburgh Letter

(From our own correspondent)

The King and Queen were in Edinburgh in July and were in residence at Holyrood Palace for ten days. During their visit there was a Royal Command Performance at the Lyceum Theatre, on behalf of the Edinburgh Royal Infirmary Extension Fund. The Fund now amounts to over £208,000. The promoters hope to reach the quarter million by next October, when a year will have elapsed since the collections were first started. This is the first visit of the King and Queen to a theatre in Scotland. No British Sovereign has attended a theatrical performance in Edinburgh since George IV

witnessed "Rob Roy" in 1822, in the old Theatre Royal, Shakespeare Square (the site of which is now occupied by the General Post Office). Sir Walter Scott was among the company. On the present occasion the play was "The Admirable Crichton", by Sir James Barrie, Chancellor of Edinburgh University.

In accordance with the usual custom, His Grace, the Lord High Commissioner of the Church of Scotland paid a number of visits to hospitals and other charitable institutions during the week of the General Assembly. At the Royal Infirmary the Lord High Commissioner presented the prizes to the nurses at the annual prize-giving and also paid a visit to Dr. Goodall's, Professor Fraser's and Mr. Struther's wards. Calls were also paid to the Royal Maternity Hospital, the Scottish National Institution for Blinded Sailors and Soldiers, the Naval and Military Veterans' Blind Asylum.

For more than ten years Scotland, with the rest of the British Isles, has been suffering from a continuous trade depression. Large numbers of persons with their dependents have been living on the dole, with all its enervating accompaniments. Under these depressing influences with their attendant worries it might have been expected that the moral and physical stamina of the people would have been seriously undermined. Actually no such catastrophe has occurred. Recent statistics show Scotland never to have been so law-abiding as at present. At the same time the health of the community is steadily improving. The annual report of the Department of Health shows a substantial decrease in the death-rate, while the infant mortality of 83.0 per 1,000 births is the lowest recorded with the exception of 1923. The death-rate from tuberculosis has also reached a record low figure. The maternal mortality rate still shows no tendency to fall, 661 deaths of mothers being registered— a rate of 7.0 per 1,000 deaths compared with 6.9 for 1929. Further, the report declares that actually, as a result of the prevailing unemployment, Scotland will emerge from the depression much better equipped in the important matters of water supply and drainage (and sanitation might well be added). This of course, has been brought about by the large subsidies given by the Government to local authorities to enable them to provide work for the unemployed. The Report goes on to point out that the outstanding problem before the new authorities is the improvement of the Poor Law medical service, and particularly the hospitals. As is well known, the Poor Law Hospitals are definitely below modern standards in construction, equipment, and arrangements for staffing. The continuance of the invidious differentiation under the new authorities would be intolerable, and it is anticipated that shortly there will be in process a general movement towards raising the standard of medical treatment of the sick poor.

Within the past few years the Edinburgh Dental Hospital and School has been completely remodelled and brought up to date. Now Glasgow is to have a new dental hospital, which will be one of the finest and best equipped in the Kingdom. During the 46 years of its existence the present hospital has been of great service to the community. Its sphere of usefulness will in future be greatly increased by the improved facilities which are to be introduced. In the new hospital there will be 70 operating chairs, each with its self-contained surgery equipment, including supply of water, gas, compressed air and electricity. There is to be a separate accommodation for children and a special x-ray department. A new laboratory will provide ample facilities for 50 students. In addition there are commodious extraction, anæsthetic and recovery rooms.

Since the War a number of local infirmaries in the intermediate Boroughs of Scotland have been rebuilt or reorganized. Stirling, Inverness and Falkirk have all brought their hospitals to a high state of modern efficiency during the last few years. Now Dunfermline—the old capital city—has to be added to the number. The existing hospital has been greatly extended by the erection of a new administrative block and two additional wards. The old part of the hospital has been completely renovated, and an extensive out-patient department has been added. The number of beds has been increased from 60 to 100, as a result of the additional services provided. The Dunfermline Hospital serves the large industrial and mining community of West Fife, and is an important institution in that thickly populated district. The expenses in connection with the extension have been met by voluntary effort. An appeal for funds met with an extraordinarily fine response, and the enlarged hospital will be opened free of debt. In spite of the constant cry that hospitals should be put upon the rates the voluntary system does not appear to be quite dead yet. The moving spirit in the work of extension has undoubtedly been Dr. Alan S. Tuke, the senior member of the honorary medical staff of the hospital. Dr. Tuke is a son of the late Sir John Batty Tuke a former President of the Royal College of Physicians of Edinburgh. Recently Dr. Tuke was presented with the freedom of Dunfermline, the city of his adoption. Such a distinguished honour has been granted to few medical men in Scotland, and is a well merited reward for years of public service.

Dr. John Glaister, Professor of Forensic Medicine and Public Health in Glasgow University has intimated his intention to retire next October. Thirty-two years ago he succeeded Professor Simpson in the Chair of Forensic

Medicine. In his earlier days he taught at the Royal Infirmary School and at St. Mungo's College. He is the author of the well-known text-book of medical jurisprudence, toxicology and public health.

The annual golf match between the Royal Colleges of Physicians and Surgeons was played over Luffness Links on May 27th. The game resulted in a win for the Surgeons by 20 games to 5. Mr. J. A. H. Duncan, F.R.C.S., won the Argyll-Robertson Medal and Mr. Wm. Gardiner, F.R.C.S., won the John Chiene Cup. In the absence of Dr. Haig Ferguson, P.R.C.S., President of the Colleges Golf Club, the dinner in the Club House was presided over by Dr. William Fordyce.

GEORGE GIBSON.

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The Irish Letter

(From our own correspondent)

The centralization of hospitals and medical services in Belfast is soon to be an established fact. Around the Royal Victoria Hospital, the new Maternity Hospital and the Children's Hospital are rapidly nearing completion. Within the same boundary walls the Medical Faculty of Queen's University has decided to erect an Institute of Pathology, with services common to all three hospital units, under the direction of Prof. A. Murray Drennan. To the students walking the hospitals this centralization will be of great advantage. At present they have to pursue their pathological studies at the University, which is a full half hour's walk from the Royal Victoria Hospital, and the Maternity, Children's, and Mater Hospitals are as widely separated. In addition, the new arrangement will result in improved medical services and an increased economy. . . . an important consideration in these difficult times. The project has been rendered possible by the generous granting of additional land by the Belfast Corporation, one of its most beneficent concessions.

There are about a dozen other hospitals in Belfast, all doing a splendid work and dealing with various forms of disease. They are dotted here and there over the city, and it is felt by the profession that, as far as possible, there should be an extensive scheme of cooperation. With the expansion of the city, most of these institutions—built in the long ago—have become over-crowded, and from time to time have appealed for financial help to enable them to extend their work. Belfast has never yet failed to respond to the cry of distress and no doubt the great project envisaged by the Medical Faculty of Queen's University in association with the Royal Victoria Hospital will be realized in the not far distant future.

The institutional treatment in Belfast is ideal and everything possible is done for the sick poor, but no provision is made in the great hospitals for middle-class paying patients. This important section of the community has not been considered in the past, but it is now suggested that the Royal Victoria Hospital should add a wing for the accommodation of patients from the middle-classes. Moderate charges will be the rule. The subject has been discussed from time to time, and the authorities concerned are hopeful that, before the principal scheme is completed, a suitable wing will be in course of erection. When this vision of the centralization of healing institutions is realized, Belfast will be more than ever in the forefront of progress so far as the medical treatment of its people is concerned.

It was suggested by Mr. David Barry, at the opening of an extension of Sir Patrick Dun's Hospital, that the Irish Free State Government might see its way to introduce a Bill to amalgamate the Dublin hospitals. Four hospitals in all, he thought, should be enough for Greater Dublin. Although it is not thought that Government legislation is the best way to deal with the matter, there seems little doubt that the Dublin hospitals will remain relatively inefficient until some process of amalgamation has been carried through. This matter has been discussed from time to time, but the presence of bank overdrafts presented a difficulty. Now, however, that several of the hospitals have had their overdrafts cancelled and money in hand, thanks to the Sweepstakes Fund, the difficulties of amalgamation are less than they were. It is earnestly hoped that some effort will be made to overcome the remaining trivial difficulties, so that a great central medical unit may emerge for Greater Dublin.

The total number of deaths from cancer in the whole of Ireland in 1929 was over 4,000, of which over 3,000 were in the Free State. This implies that at any given time there are at least 8,000 persons in Ireland who are either in the last stages of the disease or in a precancerous condition. All these persons are in need of treatment, and a large percentage of them could be cured if they received proper treatment in time. There are only two special cancer hospitals in the whole of Ireland with a capacity of less than 200 beds, which are obviously inadequate to minister to the needs of such a multitude of sufferers. Accordingly, the City of Dublin Cancer Hospital, in an attempt to widen the scope of its work, has decided to participate in the benefits of the Public Charitable Hospitals Act. The Chairman of the Committee of Management of the Hospital, Mr. D. H. Charles, LL.B.; at the annual meeting, stated that they had come to the conclusion that the voluntary or partially

voluntary system has proved a complete failure, and called upon the Government to consider this problem.

At first it was thought that sweepstakes would simplify hospital finance, but it would appear that it is making finance more difficult than ever. Dr. Moorhead, Chairman of the Board of Governors of Sir Patrick Dun's Hospital, pointed out in a recent letter to the press, that the intention of the Act which legalized sweepstakes was to supplement the ordinary income of the hospitals, rather than to form a new source of income. In practice however, hospitals find that their ordinary sources of income are beginning to dry up. Subscribers keep their pockets buttoned up, either from disapproval of gambling methods, or because they think the need for their help no longer exists. Government grants are being withheld or postponed, and grants from local authorities are under discussion by those authorities. Dr. Moorhead points out that Sir Patrick Dun's Hospital is threatened with a loss of income which if capitalized would be almost as much as has been gained from the sweepstakes. Other hospitals are likely to be as badly hit. If these statements are not exaggerated, then the benefits of the sweepstakes are likely to be less substantial than was hoped.

Up to the present the British Pharmacopœia has been the recognized standard in Ireland as well as in Great Britain. But as there is now a Medical Council in the Irish Free State, the Government has thought fit to bring the Pharmacopœia under its direct control. A Bill has been introduced into the Dail for this purpose. It provides that the British Pharmacopœia for the time being in force in Great Britain shall, subject to such modifications, if any, that may be made by the Medical Registration Council of the Irish Free State, be the Pharmacopœia of the Irish Free State. The Council is empowered to make modifications either by deletion or amendment. Further clauses provide that the medicines of the Pharmacopœia are only to be compounded according to the formularies of the Pharmacopœia, and name penalties for breach of such provision.

At the annual meeting of the Royal National Hospital for Consumption in Ireland, held in Dublin, Dr. T. G. Moorhead, President of the Royal College of Physicians of Ireland, said he was convinced that the slow decline in non-pulmonary tuberculosis was due to the fact that the disease was caused by drinking milk of tuberculous cows. This condition was due to the fact that there was no Government control of the cleanliness and wholesomeness of milk sold for human consumption, whether raw or pasteurized, although there was a complete Government control of milk sold to creameries in the Irish Free State, under the Dairy Produce Act of 1924. A clean milk Bill was urgently needed, yet, Dr. Moorhead said, when the Government was approached the reply always was: "There is no time for such a Bill."

In a communication to the *Irish Times,* Prof. Joseph Bigger, pathologist in the medical school of Dublin University, stated that at present firms advertised a special grade of milk, and that this meant nothing. He thought that some improvement in the general condition of milk had taken place in Dublin, but the great drawback was that no power existed to control the dairies outside the city boundary, or to prevent people from sending unclean milk into Dublin. He further pointed out that in 1929, of the cows slaughtered in Dublin Abattoir, 32.2 per cent were affected by tuberculosis. It has been suggested that the influence of the Royal Dublin Society, which has done so much for the improvement in cattle in other directions, might be brought to bear on the Government and force them to introduce a Bill to ensure a safe clean milk supply for the people.

A Spahlinger Institute for Northern Ireland, on lines similar to those on which the Pasteur Institute was founded, is the suggestion of Sir Lyndem Macassey. In a letter to the *Belfast News-Letter,* he points out "the amazing results" obtained in the Norfolk tests of the value of the bovine vaccine against tuberculosis, and the ease by which dairy herds can be rendered free from tuberculosis. He goes on to suggest that an Institute of this kind, where both human and bovine vaccine would be manufactured and supplied, would be of inestimable benefit to the population as a whole, and would ensure a tubercle free supply of milk, and would thus stamp out those forms of surgical tuberculosis unfortunately so common in this country. The suggestion has met with a certain amount of enthusiasm, and the Northern Government has undertaken a series of experiments with the vaccine. If these are successful, and if terms can be arranged with M. Spahlinger, it seems certain that an Ulster Spahlinger Institute will be founded.

In order to investigate the problem of radium in Great Britain and Ireland, a Radium Committee was appointed in 1928 to find out: (1) The amount of radium already held in the country; (2) how much more radium would be required for the adequate treatment of the problems presented; (3) under what conditions radium should be distributed throughout the hospital centres. As a result of these investigations it was found that there were approximately 27 g. of radium in Great Britain, spread over the various medical schools. And it was further found that an additional 24 g. would be necessary to meet the requirements of the country. This gave approximately 51 g. of radium for 38 millions of population, or 1.18

g. per million. On a similar basis of population and requirements, Northern Ireland, including the adjacent counties for which Belfast was the natural medical centre, say a population of 1½ millions, would require 2.04 g. To meet these requirements, a small stock was purchased for the Royal Victoria Hospital, Belfast, by Viscountess Pirrie, and more recently the Board of Management of the hospital obtained a special loan of £4,000, for the further purchase of radium. This supply in all amounts to a little over 0.5 g. instead of over 2 g., which is the amount considered necessary for the problems presented by a population of 1½ millions. It has been urged that the supply in the hospital is in constant use. Its limited amount entails much delay in the treatment of cancer cases, which are always urgent, so that, whilst the medical profession urge patients to seek treatment early, it almost invariably happens that when they do come they are kept waiting for treatment, owing to the radium being already booked for some weeks ahead.

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Topics of Current Interest

Ayerza's Disease

The best known clinical syndrome of pulmonary artery disease is often called Ayerza's disease. The patient is usually middle-aged and has suffered from cough and dyspnœa for many years. At this stage he presents the clinical picture of chronic bronchitis with emphysema. After many years the previously slight cyanosis increases until the complexion is almost black (hence the term *cardiacos negros*) and the dyspnœa also increases, though usually not in proportion to the cyanosis. Hæmoptysis is common and, according to Laubry and Thomas, may occur before the development of extreme cyanosis. It is then, in the absence of evidence of the usual causes of hæmoptysis, said to be a valuable early sign of syphilis of the pulmonary artery. Polycythæmia is present. The right side of the heart is enlarged, and x-rays show dilatation of the pulmonary artery. After two to five years in this stage the patient dies of heart failure, with or without œdema. Autopsy shows lesions of the large and small branches of the pulmonary artery, interpreted as syphilitic. The lungs show chronic bronchitis and emphysema, and the right side of the heart is greatly hypertrophied. Arrillaga thinks that a non-specific bronchitis, by increasing the strain on the pulmonary artery, localizes the syphilitic process there, while Escudero holds that in true Ayerza's disease the bronchitis is also syphilitic.

The clinical picture is obviously similar to that of heart failure secondary to chronic bronchitis with emphysema. The intense cyanosis, out of proportion to the other symptoms, has often been noticed. Escudero himself says that all cases of chronic lung disease with heart failure are very cyanosed and are therefore *cardiacos negros* but, in the absence of the typical syphilitic lesions in the bronchi and pulmonary arteries, are not cases of Ayerza's disease; while the lesions of Ayerza's disease may occur in patients who are not *cardiacos negros*. He says that Ayerza's disease can be distinguished from the heart failure of simple emphysema by the presence of polycythæmia and hypertrophy of the right side of the heart, a statement with which it is difficult to agree, since cyanosis of whatever origin may be associated with polycythæmia, and right heart hypertrophy is a commonplace in autopsies on cases of heart failure secondary to simple emphysema.

Although in some of the cases reported, such as those of Konstam and Hare and Ross, the pulmonary artery lesion is probably syphilitic, while in others, such as that of Warthin, the syphilitic origin is proved by the discovery of the *Treponema pallidum* in the lesion, yet in many cases the part played by syphilis is very doubtful.—*The Lancet*, 1931, **1**: 911.

Tomato Juice as a Source of Vitamins

Every intelligent person is aware of the value of orange juice as a source of vitamin C, but the value of tomato juice is not equally well known. Dr. Donald Paterson—whom Manitoba may claim as a son—in his book, "*Sick Children*" published in 1930 writing of the treatment of infantile scurvy says:

"Vitamins in the form of orange juice, grape juice, grapefruit juice or tomato juice should be given."

In the latest (1926) edition of Holt and Howland's "*Diseases of Infancy and Childhood*" is this statement:

"An efficient anti-scorbutic is the juice of fresh or canned tomato which (carefully strained) may be given in about the same doses as orange juice."

"If it's canned, it's fresh" is the commercial canners' way of expressing the fact that canned tomatoes, for example, are actually more truly 'fresh' than are the uncanned tomatoes usually available in the stores. Moreover, canned tomatoes are really ripe, and it is a maxim that natural ripeness is necessary to achieve the finest

flavour and that, in turn, finer favour is proof of greater healthfulness. Tomatoes for canning are grown close to the canning plant. Instead of being picked green and shipped in that condition to distant markets, these tomatoes are sun-ripened and then picked and packed the same day, thus retaining their 'garden freshness' as well as their flavour perfection due to perfect ripeness.

In these days, when it is needful to get one hundred cents' worth of value for every dollar, canned tomatoes supplied by Canadian canners may well be considered as a substitute for the juice of imported oranges. Adults, as well as babies, can readily enjoy tomato juice cocktails, and the thrifty housewife can make good use of the solid portion left after straining.—*Man. M. Bull.*, June, 1931.

Intoxicating Drink Saves the Race in Mexico

Pulque, a Mexican drink inherited from prehistoric times and for which prohibition has been urged because it is blamed for the degeneracy of the Indian, may have been keeping him alive this long.

Under the direction of Dr. José Zozaya, director of the Hygienic Institute of Mexico City, studies are being made for the first time on foodstuffs used by the native population. The first material thus investigated was pulque, and the results show that this slightly intoxicating liquor is extremely rich in yeasts. The native diet on the central plateau where pulque is the great drink, consists mainly of chili, beans, and corn, an unbalanced and incomplete ration in the light of what is now known of man's requirements. Because of such a diet, rickets should be the prevalent disease of that region, but, curiously enough, crooked bones are rare, and in spite of extremely unhygienic living conditions those that survive the infectious diseases of childhood grow surprisingly strong. The strong back of the pulque-drinker supplies most of the transportation in rural Mexico. Indian babies are often weaned on pulque, and as soon as they can walk they consume chili that would make a strong man cry.

What part "alpine" sunlight on the high Mexican plateau plays in the prevention of Indian rickets is not known, but Dr. Zozaya is convinced that pulque, with its plentiful yeasts rich in the vitamins and amino-acids that corn and beans lack, has probably served to keep the race alive, rather than to kill it off. He finds that in spite of the very bad water supply of many pulque haciendas, intestinal infections there are rare.

Pulque is the fermented juice of the maguey, or century plant, which with the cactus is the most characteristic object on the Mexican landscape of the central plateau. Because of its undoubted nutritional value, as well as the enormous capital invested in the industry, Dr. Zozaya believes a hygienic control of the industry is what is indicated at this time, rather than prohibition.—*Science News Letter,* Feb. 14, 1931.

Sale of Proprietary Medicines in U.S.A.

We have read with sympathetic interest the details of a proposed plan for the control of the sale of proprietary remedies in New York. The author of the scheme is Dr. Samuel M. Gordon, secretary of the council on dental therapeutics of the American Dental Association, who was invited by the Commissioner of Health of New York to make a survey of the present drug administration of that city and offer suggestions how to bring its activities into line with present-day notions. The sale of proprietary medicines in the United States is already subject to control; the operation of the Pure Food and Drugs Acts and the special regulations adopted in various States suffice to prevent many of the practices which are common enough in this country. Nevertheless, American legislation has not sufficed to suppress the evil, and although the heyday of the business seems to be past in the United States and the old method of advertising may have been suppressed, "it has been replaced," says Dr. Gordon "by a more subtle and more insidious exploitation of articles for various groups of ill-defined conditions, based on an evasive appeal to the health desires of the public . . . . Patent medicines are exploited by means of subtly written advertisements in such manner that the uncritical and none too careful reader is allowed to read into general, and, as a rule misleading statements, that he or she is suffering from diseases or conditions for which a patent medicine in question possesses curative properties." The cunningly worded devices do not contravene the law, although they are obviously contrary to its spirit. What has happened is that the Drug Acts having made the "lie direct" a penal offence it has become necessary for medicine-mongers to resort to "the lie by inference." It is the desire of the New York Health Department to outwit the users of the "lawful" form of falsehood, and it is thought that this could be accomplished by putting Dr. Gordon's scheme into operation.

Most of us know the dexterous member of the family who tells us without looking at it

which particular card "you hold in your hand." The trick depends upon the conjuror's ability to make us pick the card he intends us to pick. Dr. Gordon writes:—

> To-day advertising has invested itself with a psychological basis intended to make people purchase something for which there is no intrinsic need. It does not appeal to real needs, but it appeals to desires stimulated by the wording of advertising. When applied to clothing, automobiles, radio, and the like, the loss is merely an economic one. Where applied to patent medicines the aim is to make well people believe they are sick, and sick people believe they are very sick. A stimulation mentally to force the purchase of a patent medicine is thus brought about by adroitly worded advertising in newspapers . . . . Consequently this is not merely an economic waste but presents an actual menace to the physical and mental well-being of the country.

The morality of salesmanship which aims at inducing people to buy something they do not want and cannot afford to pay for has often been argued. It would, however, require a good deal of special pleading to whitewash the salesman or the copy-writer who, for the sole purpose of gain, succeeds in making some deluded person buy a cure for cancer or a pill to rejuvenate the arteries. Dr. Gordon's method would be to put such a person in gaol. The case as put by him furnishes convincing evidence of the need of further action to protect the fool from his folly. One difficulty lies in the fact that even people of culture are among the victims from the nostrum-monger and a considerable proportion of his earnings comes from the pockets of learned ignoramuses. If, then, in spite of all their enlightenment some apostles of culture are not averse from swallowing rubbish in the guise of nostrums, what is to be done to get down to the masses? Dr. Gordon believes in specialized education. He would invite the citizens of New York to write to the Health Department for information and advice on specific medicines in which they are interested. He would set up what he calls a rogues gallery. He would invite newspaper proprietors to submit advertisements of patent medicines to the Department before publication and to undertake to require advertisers to confine statements to the recommendations of the Board of Health, and his plan for dealing with those publications "which show a tendency to subvert the public health interest to financial returns" is to make them see light by a carefully planned educational campaign through the medium of other papers which are willing to follow the Department in their campaign for honesty and decency in medical advertising to the public. If the experiment is tried, as we hope it will be, the results will be examined with interest here.—*The Lancet,* 1931, **1**: 1095.

Medico-Legal

THE DUTY OF SURGEONS TO IMPART INFORMATION TO ENABLE PATIENTS TO MAKE DECISION

A recent judgment by Mr. Justice McEvoy of the Supreme Court of Ontario is of interest to surgeons. A woman consulted a surgeon in November, 1929, with reference to a swelling in the palm of her right hand. The surgeon examined her hand and referred her to his colleague advising her to act upon the advice of the latter. The ailment was diagnosed as Dupuytren's contraction and operation was advised. The operation took place and the plaintiff complained that the operation was not successful and that it should not have been performed. In his judgment, Mr. Justice McEvoy stated that it was the duty of the defendants to enlighten the patient's mind in a plain and reasonable way as to what her ailment was, as to what were the risks of operating promptly, what were the risks of delaying the operation, and what the risks of not operating at all. Having discharged that duty, it was their further duty to secure from the patient a decision or consent as to what course is to be followed, and if that decision or consent is not had and the surgeons operate and the operation turns out badly the surgeons are liable. Such a relationship is established between a person of special skill and knowledge and a person of no skill or knowledge upon the facts required for the making of a decision that, unless the person with the special skill and knowledge discharges the duty which he owes of placing the patient in a position to make a decision, that person, when he is employed and paid because of his special skill and knowledge, has failed to perform his duty, and that breach of duty makes him liable in damages for untoward results.

When the surgeon plainly and knowingly minimizes the danger of the treatment to induce the patient to proceed, and plainly and knowingly refrains from explaining to the patient the advantages and disadvantages of an alternative course well known to him, he brings himself within the field of liability.

There should be judgment for the plaintiff against the defendants for $3,000 damages and costs of the action.

THE MEDICAL ACT OF ALBERTA

The Medical Act of Alberta has the following clause:—"No person shall be entitled to recover in any court of law for any medical or surgical advice or for attendance or for the performance of any operation or for any medicine which he may have prescribed unless he is registered under this Act and not under suspension." On the strength of this clause a district judge dismissed an action taken by a firm of physicians

and suggested that the name of the physician who rendered the services be entered instead. The case was appealed and the Appeal Court reversed the former decision and decided that where there is a partnership, suit can be made for the services of any member of the firm, and that under the firm's name.

PROOF OF RELATIONSHIP

The objection to the admission of hearsay evidence is a well-known feature of English law. Sometimes, however, necessity compels a compromise with the principle. In criminal proceedings before Mr. Justice McCardie at the end of last year, it was essential for the prosecution to prove that two persons were brother and sister. The prosecution tendered the evidence of a witness who said he had always regarded them as such. Counsel for the defence objected that this was mere hearsay and must be rejected. The judge admitted the evidence. To hold it hearsay, he is reported to have said, would be to destroy all the laws of evidence. A man could not know his mother because he could not personally remember his own birth; a father would not be able to say "this is my son" unless he had been present at the birth. In spite of these judicial dicta, it might be more frank to say that such evidence is admitted of necessity because the facts cannot otherwise be established. In genealogical cases the evidence of entries in the family Bible or of tombstone inscriptions is admitted partly on the ground that publicity supplies the want of connection between the entry or inscription and the particular individual. There is a presumed absence of any interest to misrepresent the truth; it is also presumed that the person who made the entry or ordered the inscription had peculiar means of knowing the facts; in the background somewhere, too, there is probably the feeling that a decision on the available information is necessary and that the information is not available in any other form. But such information will not be allowed as evidence on a question of relationship in non-pedigree cases—e.g., on the question whether two persons are brother and sister under Section 3 of the 1908 Act for the punishment of incest.—*The Lancet*, 1931, as 158.

That man has had a liberal education who has been so trained in youth that his body is the ready servant of his will and does with ease and pleasure all the work that as a mechanism it is capable of, whose intellect is a cold clear logic engine with all its parts of equal strength and in smooth working order . . . . . whose mind is stored with a knowledge of the great and fundamental truths of Nature and of the laws of her operations, one who, no stunted ascetic, is full of life and fire, but whose passions are trained to come to heel by a vigorous will, the servant of a tender conscience, who has learned to love all beauty, whether of Nature or of Art, to hate all vileness and to respect others as himself.—Thomas Henry Huxley.

Abstracts from Current Literature

MEDICINE

The Rheumatic Child. Tighe, H. R., *J. Roy. San. Inst.*, 1931, **51**: 560; and McSweeney, C. J., *Ibid.*, 570.

We review together two papers presented at the Swansea sessional meeting of the Royal Sanitary Institute in March last. Both papers emphasize the importance of adequate care of the rheumatic child in the prevention of crippling heart lesions.

Tighe presents figures to show that this is a much more pressing matter in the interests of the public health than many other conditions which have profoundly stirred public opinion, and urges that we maintain a sense of proportion and give it a proper share of attention. "Rheumatism does not kill or cripple except through the cardiac apparatus, and it is only during the years of childhood that the heart is sensitive to the rheumatic poison. It follows that if we can protect the heart during the years of growth, even though we never cure the rheumatism, the latter will eventually tend to cure itself." Tighe emphasizes the importance of early diagnosis and registration, removal of septic foci, a diet containing sufficient lime and vitamins, open air and sunshine, and frequent re-examination, with particular attention to the heart. He is a strong advocate of the hospital school for rheumatic children, and this should be what the term implies—a real hospital in which there is provision for the teaching of children to the extent warranted by their physical condition. He has not attained to this ideal, but a hospital for rheumatic children has been established at Swansea without provision for teaching. Such encouraging results are being obtained that Tighe feels justified in asserting that rheumatic crippling is preventable by means within the power of the community. Almost without exception the children have done well, and even severe heart cases have responded in a gratifying way.

McSweeney's argument is along very similar lines. Early treatment is essential if we are to prevent the heart being damaged to a degree that makes complete restoration impossible. When it is considered "that at least half of the total deaths from heart disease which occur annually in any community are attributable to rheumatism contracted during childhood, it is obvious that the first step towards the prevention of heart disease must be the early treatment of juvenile rheumatism." McSweeney reports the results obtained at a small (24 bed) hospital opened at Cardiff early in 1930, where the demand for accommodation is such that many patients cannot be kept as long as is desirable,

but where this deficiency is compensated to some extent by a supervisory clinic. Here, too, excellent results have been obtained. Relapses occurred after discharge in less than 9 per cent of cases, nearly all being attributed to unsatisfactory home conditions and lack of parental cooperation. "So far the indications are that the children discharged from hospital with normal hearts continue in the great majority of cases to keep well, any relapses which occur being much milder than the initial attack. Even in those cases where hospital treatment has not succeeded in restoring the heart to normal, the children seem to be much less likely to develop recurrences, and if relapses do occur they seem to be of less severity than in cases who have not undergone a period of in-patient treatment."

Thus do two eminent medical officers of health confirm the opinion of clinicians generally that adequate care, and especially the care which can be best obtained under trained supervision, is of supreme importance to the rheumatic child.

W. H. HATTIE

An Outbreak of Trichinosis in Pennsylvania. Aldridge, F. C., *Am. J. M. Sci.*, 1931, **181**: 312.

The parasite found in muscles of rat, pig and certain other animals enters the stomach when the meat is eaten; its capsule is digested by gastric juices and the worm passes on to the small bowel where it burrows into the intestinal wall. From this point the embryo enters the lymph stream, reaches the blood stream, and so is carried to all parts of the body, finally becoming encysted in a muscle. As high as 6 per cent of hogs are infected, which is important as most cases are of porcine origin.

There is an acute gastroenteritis, with a general systemic reaction, even pulmonary congestion going on to bronchopneumonia as the parasites reach the brain, heart, lungs and other organs. Fever, headache, swollen face, sore muscles develop later with anæmia, loss of weight, and general malaise. Diarrhœa, even hæmorrhage from the bowel, vomiting, constipation, gaseous distention all show that the intestines are affected. Muscular symptoms vary from practically no disturbance to the severest pain; the eye conditions from retinal hæmorrhages to optic neuritis. The blood shows a leucocytosis and an eosinophilia. There is also some increase in the spinal fluid cell count.

The treatment is purgation, enemas and convalescent serum. Prevention lies in the destruction of carcasses of hogs that die of any disease, even of pork scraps in slaughterhouses, the extermination of rats and mice and, most important, thorough cooking of pork before eating.

The cases quoted came from pork which was raised on a farm where 15 hogs had just died of pneumonia, which was obviously secondary to trichinosis.

P. M. MACDONNELL

The Mantoux Test. Gaisford, W. F., *The Lancet*, 1931, **220**: 521.

Intradermal injection of old tuberculin (0.1 c.cm. of 1/1000, equivalent to 1/10 mg.) in a large number of patients admitted to the East London Children's Hospital has convinced Gaisford that the test is of much practical value. A proper needle should be used, and it is important that the tuberculin should be injected into the skin only. Positive reactions fall into two main groups, which differ in the intensity of the local manifestations. In both there is, at the site of injection, a circular or elliptical wheal varying in diameter up to 1½ inches. This is composed of two definite strata — an outer erythema and an inner brawny œdema. In the more acute type there is also a central vesicular area, and the extent of erythema is greater. The outer area fades more quickly; the inner area desquamates and presents a brown discoloration which persists for two to ten weeks. The discoloration is the constant and essential feature. There are, of course, anomalous reactions, which require special consideration. The test is easily made and is painless to the average child; a negative result (sources of error being excluded) excluded tuberculous infection — a comforting finding in debilitated children after measles, whooping cough, and bronchopneumonia and in cases of chronic cervical adenitis and so-called "intestinal indigestion"; a strongly positive result in young children suggests active tuberculosis and usually justifies a bad prognosis; a mild positive result indicates tuberculous infection (not necessarily disease), and children showing such a reaction would benefit from open-air treatment and increased prophylactic precautions.

W. H. HATTIE

SURGERY

Asymptomatic Common Duct Stones. Klingenstein, P., *Ann. Surg.*, 1931, **93**: 1146.

Stones in the common duct usually result in pain, jaundice, intermittent fever, absence of bile from the stools, bile pigment in the blood serum and urine, and sometimes cholæmia. This syndrome may vary not only in degree but in the complete absence of one or another of the diagnostic criteria. Thus, pain and jaundice may be lacking. Five cases are cited by the author, in none of whom was a common duct stone suspected. Exploration showed one or more present in the five cases. The reported ratios of unsuspected common duct stone being found at operation varies from 1 to 10 per cent. Duration of symptoms referable to the gall bladder does not seem to influence the possibility of common duct stones. The common duct should be explored in all cases showing jaundice after attacks of gall stone colic, or dilatation of

the common duct. In spite of the lack of signs and symptoms of a common-duct stone the possibility of its presence should always be borne in mind when removing a calculus-containing gall-bladder.

STUART D. GORDON

Diverticula of the Colon and Their Sequelæ. Lockhart-Mummery, J. P. and Hodgson, H. G., *Brit. M. J.*, 1931, 1: 525.

Diverticula are the commonest pathological lesions of the large bowel. They may occur anywhere in the colon, including the appendix, with the exception of the rectum. Uncomplicated cases can only be diagnosed radiologically. About the age of 45 the muscle sheath of the large gut appears to lose its tone in certain individuals. Bulging of the mucous coat results, usually where the blood vessels pass in. There appears to be a relation between this atonicity and the propensity to excessive fatness. Once formed, the diverticula tend to increase in size gradually. A barium enema, following a high colonic douche, affords the best method of diagnosis. Radiographs should be taken at oblique angles as well as antero-posteriorly.

Inflammation of the diverticula is the dangerous complication. This may result in peritonitis, or in the formation of fæcal sinuses. Perforation apparently may occur without any inflammatory change. Diverticula are not a common cause of cancer.

The best results follow resection of the involved portion of gut. A localized lesion is unfortunately rare. Operations on the complications of diverticula are often difficult, but the results are usually excellent.

STUART D. GORDON

OBSTETRICS AND GYNÆCOLOGY

Indications for the Induction of Premature Labour. Smythe, H. J. D., *Brit. M. J.*, 1931, 1: 1018.

Indications for the induction of therapeutic abortion as well as premature labour are included.

In the chronic nephritic case one has to consider the number of pregnancies, the term of pregnancy at which signs or symptoms of nephritis were first observed, and the severity of the nephritis. Two types of cases are met with: the known nephritic who shows signs of severe kidney dysfunction early in pregnancy; and the patient with a previous minor lesion of the kidney, which eventually breaks down with the added stress of pregnancy. For the former early evacuation of the uterus is advocated, for the latter induction of premature labour. If a child is especially desired the patient may be placed on dietetic and medicinal treatment unless danger signals arise. In all cases of chronic nephritis, however, induction is indicated between the 36th and 48th week in order to save the kidney further damage and, in many cases, to save the life of the child. A case of pregnancy albuminuria which has reached the 38th week, and which, in spite of treatment, still shows albuminuria calls for induction of labour, especially when there is marked œdema.

In pernicious vomiting the indications for clearing out the uterus are progressive loss of weight, bilious vomiting unconnected with the taking of food, scanty and albuminous urine (especially if blood is present), rises of temperature, rapid pulse, and the slightest sign of jaundice. Any one or more of these signs may make evacuation of the uterus imperative if the patient's life is to be saved.

The pyelitis of pregnancy usually yields readily to treatment, but in severe cases not clearing up under treatment, or when frequent relapses occur and the patient's general condition becomes progressively worse, induction is indicated.

Patients with compensated heart disease pass through pregnancy and labour usually without ill effect; but labour should be shortened by forceps delivery, or, better still, by an induction about the 38th week. Active phthisis is an indication for early evacuation of the uterus. Should pregnancy, however, have gone beyond the fourth month there is nothing to be gained by interrupting its course. In epilepsy interference with the pregnancy is not necessary unless the fits become too frequent, or are uncontrolled by drugs and endanger the patient's life. Puerperal mania, or insanity of lactation, in the previous pregnancy is a definite indication for the termination of pregnancy.

Disproportion is the condition above all others in which induction of labour is indicated. Definite overlapping should not be waited for. Induction should not be advised unless the true conjugate is at least 3½ inches, and unless pregnancy can be allowed to proceed to the 32nd week. In the case of occipito-posterior positions labour may be induced at the 38th week. An attempt should be made to rotate the head and anterior shoulder into an anterior position which may be maintained with pads and binder. In some cases of breech presentation where external version has failed, induction at the 38th week is indicated.

The method advised is rupture of the membrane, at a point above the fetal head in vertex presentations, with a double curved silver catheter similar to a prostatic catheter and armed with a stylet which can be protruded at the distal end of the catheter. From one-half to one pint of liquor amnii is drawn off and then the catheter is withdrawn. There is practically no further escape of liquor, so that when labour commences a definite quantity of amniotic fluid is still present.

ROSS MITCHELL

Factors and Causes of Fetal, Newly Born and Maternal Morbidity and Mortality. Ehrenfest, H., *Am. J. Obstet. & Gyn.*, 1931, **21**: 867.

The mortality during the six months preceding viability apparently surpasses the total mortality from that time to the age of sixteen years. Available statistics establish for all the civilized world a continuously rising incidence of abortions as the direct result of a steady increase of wilful interruptions of pregnancy. In Germany the ratio between abortions and term births in 1927 was approximately 1.1. In the United States, during 1927 and 1928, 25 per cent of all maternal puerperal deaths followed abortions. Next to abortion rank diseases which either precede impregnation or appear as complications in the course of pregnancy ,such as syphilis, tuberculosis, cancer, anomalies of the kidneys, heart, certain endocrine glands, blood and teeth, the acute infectious diseases, parasitic infections, toxæmia.

Of recognized importance in the causation of mortality and morbidity of both mother and infant are traumatic lesions and infections sustained in the course of labour and delivery. Responsibility for birth injuries does not necessarily rest with the obstetrician, but their occurrence is influenced by his judgment and skill. This is particularly true in respect to all artificial and operative deliveries. Relief from pain given to women in labour must be absolutely free of all possible harm to either mother or child. Asphyxia of the newborn is due in a very large number of instances to some damage of the respiratory centre. Whenever an intracranial injury is suspected 20 c.c. of parental blood should be injected hypodermically as a prophylactic measure. If definite conditions justify the artificial start of labour, the artificial rupture of membranes, particularly when preceded by the administration of castor oil and quinine, represents the safest and most satisfactory procedure at present known.

The following recommendations are made:— Efforts must be increased to provide better prenatal care to more women. In general, only early diagnosis allows adequate treatment of a disease which complicates pregnancy and is likely to harm mother or baby. A warning should be disseminated that compliance with the insistent demand of women for shorter and more comfortable labours inevitably implies risks both for mother and baby. Interference with pregnancy or labour should be limited to well-defined indications. In view of the fact that abortions are responsible for a large part of maternal mortality and particularly for later maternal morbidity, at least all febrile cases of abortion should be hospitalized. Appropriate changes should be made in official birth and death certificates, so that more precise information can be obtained concerning the actual causes of death of either mother or infant in connection with pregnancy and birth.

ROSS MITCHELL

UROLOGY

Calcification Within the Tubules of the Kidney in Association with Urinary Tract Lithiasis. Crabtree, E. G., *Trans. of the Am. Ass. of Gen.-urin. Surg.*, 1930, **23**: 17.

Careful examination of nephrectomy specimens in cases of renal lithiasis was made to locate small calcifications, in the hope that by such information clean operative removal of small calculous fragments might be made easier. One result of such study has been the discovery of three cases in which more or less extensive stone formation had taken place within the tubules in some portion of the kidney. In but one of the cases did the plate taken at the time of operation indicate the calcification within the tubules. In all three instances there had been some form of obstruction to drainage and the tubules which contained the calcareous material, as well as the others near by, showed dilatation. It is the author's opinion that dilatation is a requisite of such formation and it is of interest also that a colon bacillus infection was present in each case. This is a condition which has been rarely noted in the literature, but in the few instances in which it has been sought several cases have been found. It is an entirely different entity and must not be confused with the "uric acid infarcts" of infancy. (Its significance seems more comparable to similar calcification in the prostate gland). Its chief clinical significance seems to rest in the fact that when stones are removed from the pelvis and adequate drainage established the calcifications may also pass into the pelvis where some may remain and serve as a basis for recurrent stone. Such an occurrence seems to have been established in one of the cases noted.

In commenting on the paper, Dr. O'Connor cited a case in which he had removed a kidney because of persistent bleeding. The kidney appeared normal, but on section the pelvis and calyces were lined throughout with a very fine sand which had shown no shadow in repeated skiagrams.

N. E. BERRY

Study of Blood Pressure in Prostatism. Seng, M. I., *J. Urol.*, 1931, **25**: 313.

An intensive study was begun to determine the possible influence and true significance of blood pressure in prostatism. Pressures were divided into: low, those having a systolic pressure under 140; normal, those having a systolic reading of between 140 and 160; and high, those where the systolic pressure was over 160. The study of these three groups includes an estima-

tion of the average systolic and diastolic pressures, the pulse pressure, and the pulse rate, together with the renal functional tests and blood chemistry findings taken concurrently. The readings were made before the relief of urinary retention, after such relief, and after prostatectomy. The investigation attempts to determine the reason for the successful termination of most cases and the fatal ending of others.

Of a total of 454 prostatectomies successfully performed the largest number is found in the normal blood pressure group (38.1 per cent); the next largest number comes under that group whose blood pressure is low (33.4 per cent); the smallest group comprises those with high pressure (28.5 per cent). In the low blood pressure group the systolic and pulse pressure drops after drainage, and the kidney function improves. After prostatectomy the pulse again rises, the pulse rate is increased, and renal function continues improved. In the normal blood pressure group, after drainage, both systolic and pulse pressures drop sharply, the diastolic pressure also; renal function is improved. After prostatectomy both pressures show a steady rise, and also the renal function. In the high blood pressure group, drainage lowered the systolic pressure markedly, diastolic and pulse pressures less decidedly, and renal function improved; after prostatectomy the systolic and pulse pressures even more; the diastolic is not affected, due to the rigidity of the vascular tree. Renal function becomes somewhat impaired in contrast with the other groups. The patient with a normal blood pressure presents a resilient cardiovascular system. The man with a low blood pressure approaches more closely to normal. His cardiovascular system is flaccid, but is sluggish. On the other hand, the patient with a high blood pressure has a system which has lost its resilience, because it has been damaged either at the cardiac end or in the vascular tree.

A scrutiny of the chart of the cause of death and autopsy findings in fatal cases shows some form of cardiovascular lesion of sufficient gravity to be considered a principal contributing factor in the cause of death of each of the three blood pressure groups. Almost 50 per cent of all the deaths show some such lesion. The pulmonary system provides the next most common lesion proving fatal in prostatectomy; the renal system next, and infections least common. The difference in the findings in the renal system of those who survived and those who succumbed to prostatectomy is not marked, whereas that in the findings in the cardiovascular systems is striking. Those who succumbed showed on routine examination a marked increase in the incidence of intrinsic disease of the heart muscle itself, and these observations are reflected and magnified in the autopsy findings and cause of death. Blood pressure observations alone are not sufficient index of the condition of the cardiovascular system, but they do point the way. The man with normal blood pressure is the ideal risk. His cardiovascular system can stand the shock of prostatectomy. He heals readily. Death comes to him frequently from cardiovascular disease and accidents but almost as frequently from pulmonary involvements. The low blood pressure individual is not quite so good a risk. His cardiovascular system can withstand prostatectomy, but he is slow to heal. He dies of cardiac and renal involvements. He frequently is the type of case so advanced in renal and cardiovascular breakdown that only drainage can be instituted. The prostatic with high blood pressure is the greatest surgical risk. If he survives he is just as likely to heal rapidly as to take a long time in healing. Death comes to him largely from cardiovascular, pulmonary and renal lesions.

It is significant that in the complications of the successfully prostatectomized almost one-half of the complications have as a basis infection of some degree or sort. While infection forms the smallest percentage of the cause of death its appearance in the presence of more or less grave lesions of the cardiovascular, renal or pulmonary systems adds so much more to the load that it frequently becomes "the straw that breaks the camel's back." In a word the myocardium and infection together form a formidable source of potential disaster in prostatism.

N. E. BERRY

Enucleable Multilocular Abscess of the Kidney.
Neff, J. H., *Trans. Am. Ass. Gen.-urin. Surg.*, 1930, **23**: 27.

Two cases are reported in which cortical (*S. aureus*) infections were operated upon. In each instance a localized abscess was found, sufficiently walled-in to permit of a clean enucleation, leaving only a depression on the surface of the congested kidney. A review of the literature shows that many authors have recognized the fact that these inflamed conditions do frequently become walled-in. Israel was the first to use the term "carbuncle", and in his first patient he states that it was so sharply defined in colour and consistency as compared with the uninvolved kidney as to give the impression of an imbedded tumour. In other instances, the margin is imperceptible and there may be multiple lesions in the same kidney. In a series of 57 cases of cortical infections collected from literature nephrectomy was performed 28 times with 2 deaths; secondary nephrectomy 8 times with 1 death; primary excision 6 times with no deaths; secondary excision twice with no deaths, and enucleation twice with no deaths. Primary nephrectomy then seems to offer the smoothest convalescence, but when one considers the frequency of involvement of the opposite kidney

drainage would appear to be preferable in the first instance. Enucleation, when possible, is ideally conservative.

N. E. BERRY

OPHTHALMOLOGY

Spastic Entropion; a simple Procedure for its Cure.. Hughes, W. L., *Am. J. Ophth.*, 1931, **14**: 34.

Spastic entropion consists of a tonic contraction of the orbicularis palpebrarum muscle which characteristically produces an inturning of the lower lid, with consequent irritation of the eye from the lashes. The great number of procedures advocated for the correction of this condition speaks for the ineffectiveness of the majority of them. Hughes suggests a simple innocuous procedure, designed to replace adhesive strapping and operation in the majority of cases, requiring little technical skill, no elaborate preparation, and no instruments other than two small syringes and one hypodermic needle. It consists of injection of alcohol into the outer portion of the orbicularis muscle of the lower lid near its attachment to the lateral palpebral raphe, the idea being to produce a loss of function in about the lateral fourth of the muscle.

The technique is as follows. The skin about the lateral canthus is painted with 3 per cent iodine, and then 0.3 c.c. of a 4 per cent solution of novocain is injected into the outer fibres of the orbicularis muscle, extending a distance of about 4 to 5 m.m. into the lower lid near the margin. Leaving the needle in place, the syringe is replaced with one containing 0.2 to 0.3 c.c. of 95 per cent alcohol (not denatured), which is injected into the same site. There is usually no pain and no reaction, and the results are apparent a few hours after the injection (sometimes at once). The procedure can be repeated in a few days, though this is seldom necessary.

S. HANDFORD MCKEE

On the Pigmentation of the Conjunctiva in Normal Individuals and in cases of Keratomalacia in Adults. Puscariu and Nitzulescu, *Brit. J. Ophth.*, 1931, **15**: 18.

In his studies concerning xerophthalmia and keratomalacia in China, Pillat has called attention to a particular pigmentation of the conjunctiva. He found this one of the most striking symptoms of xerosis, as it was found in about 70 to 80 per cent of the cases. As to the origin, some authors think it due to a disturbance in the functions of the liver, and see a connection with the icteric state of the conjunctiva, signs of cirrhosis, etc., frequently found in such patients. On the other hand, Mori and Pillat think that such pigment is melanin accumulated through a mechanism still unknown, as a result of the processes of degeneration going on in a xerophthalmic conjunctiva. Puscariu and Nitzulescu report and give the details of a case of conjunctival cirrhosis in which pigmentation was noticeable.

A farrier, aged 68 years, attended a clinic for a marked diminution of vision and senile ectropion. On the external part near the corneal limbus was found a small xerotic lesion covered with the characteristic foamy deposit. Very near to it was a larger white dim nodosity. Around both one saw a very heavy, blackish brown pigmentation which appeared in marked contrast with the white of the neighbouring lesion. The ocular conjunctiva was yellowish brown, the inferior part of the globe was also slightly pigmented. The corneal limbus was pigmented especially in the superior and inferior portions, less in the internal and external ones. The pigmentation appeared as a blackish strip, composed of little spots like in mosaic work. The everted tarsal conjunctiva showed a characteristic pigmentation appearing striped like the coat of a zebra. The interesting fact was that the patient belonged to a race which is naturally pigmented (gypsies), this explains we think why this xerosis showed pigmentary changes. Numerous facts incline the authors to accept Pillat's opinion, that the xerophthalmic pigmentation is due to melanin. In conclusion, they think that the abnormal pigmentation seen in xerophthalmia in coloured people should be considered as the manifestation of a special reaction, the intensity of which varies according to the particular capacity of the trophopigmentary tissue of different races, being most reduced in the white race.

S. HANDFORD MCKEE

NEUROLOGY AND PSYCHIATRY

Neurological Aspects of Head Injuries. Hengstler, W. H., *Minn. Med.*, 1931, **14**: 509.

After referring to the great increase in the number of head injuries and their great importance, the author points out that all such have a neurological aspect and are not simply problems in general surgery, as they so frequently and unfortunately are considered to be. The important fact to be remembered is that there is no constant relationship between the gravity of the cranial and intracranial injuries. The term "concussion" has no universally recognized meaning, but the author feels that it should not be limited to cases with interference with consciousness for twenty-four hours or less. Sudden and severe cerebral œdema, bruising, contusions or lacerations of brain substance and hæmorrhage are the usual results of injury.

Treatment must be prompt and carefully thought out. If the period of unconsciousness has been short, nothing is indicated other than

rest and symptomatic relief. In more serious cases, repeated and frequent examinations must be made to establish the extent of injury. Repeated spinal punctures are advocated as the best way to keep down the intracranial pressure.

Assessing the value and permanency of symptoms and signs is an important and difficult task, and it is pointed out how important it is to consider each case on its own merits. The majority of symptoms and complaints are *subjective* and include headache, vertigo, nausea, inability to concentrate, loss of memory, ease of fatigue and emotional disturbances. Most of these disappear irregularly in periods varying from three months to one year following injury, depending, of course, on age, individual constitution, and the extent to which litigation enters into the case. The objective symptoms and complaints are paralysis, vomiting, reflex changes, insomnia, loss of weight, emotional disturbances and amnesia. Of these, it is stated that those remaining over a year will probably be permanent. It is remarkable how frequently definite "organic" signs disappear in a few months. As to final results, the author quotes Symonds' figures; 10 per cent totally disabled; 43.5 per cent able to return to light work; 46.5 per cent able to return to full work.

A. T. MATHERS

Superior Cerebellar Artery Syndrome. Russell, C. K., *Arch. Neurol. & Psych.*, 1931, **25**: 1003.

The author submits the clinical and autopsy records of a very interesting case occurring in a man of 67 with many of the general symptoms of vascular disease. The symptoms and signs of focal damage were ataxia of the left upper and lower limbs, strong rebound phenomenon on the left side, definite loss of pain and thermal sense over the whole right side. A diagnosis of a vascular lesion of the superior cerebellar peduncle involving the brachium conjunctivum and spino-thalamic tract on the left side was made and subsequently confirmed at autopsy.

A. T. MATHERS

Encephalitic, Idiopathic and Arteriosclerotic Parkinsonism. Keschner, M. and Sloane, P., *Arch. Neurol. & Psychiat.*, 1931, **25**: 5.

The authors state that the main objects of their investigations were: (1) to record several cases of Parkinsonism followed for many years clinically and eventually studied histologically; and (2) to determine how far the clinical picture could be correlated with the anatomical findings.

Seven cases were studied, 3 of chronic post-encephalitic Parkinsonism, 2 of the idiopathic type, and 2 of arteriosclerotic origin. The differential diagnosis is extremely difficult and is in many cases impossible. Certain generalizations may however be made. (1) In the post-encephalitic the onset is, as a rule, fairly acute, but the condition, once established, tends to remain stationary or to progress extremely slowly. The arteriosclerotic cases progress more rapidly and may in some cases advance in jerks following a series of apoplectiform insults. The idiopathic group show a slow but steadily progressive involvement. (2) Tremor is most common in the idiopathic and arteriosclerotic groups, while the post-encephalitic not infrequently shows no tremor whatsoever. Muscle tone is markedly increased in all cases and is indeed the basis of all the more obvious signs of the Parkinsonian. (3) Involvement of areas other than the basal ganglia is frequently seen. In the arteriosclerotic the detection of focal cerebral or cerebellar signs in association with the Parkinsonian syndrome may be regarded as almost pathognomonic. Pyramidal tract injury and oculomotor disorders are especially common in the post-encephalitic; the oculogyric crises are almost invariably confined to this type. (4) Psychic disorders are common. In the post-encephalitic there is a strong tendency to impulsive behaviour, antisocial acts of various sorts, and emotional outbursts, with however little or no intellectual impairment. A mental picture very different is the retarded arteriosclerotic with failing memory, irritable, and easily moved emotionally, gradually progressing to marked deterioration.

The greatest difficulties of diagnosis lie in those cases in which undoubtedly arteriosclerotic patients show evidence of Parkinsonism following some obscure febrile disorder. In such cases the history and clinical course, the presence or absence of oculomotor involvement, and the mental state must be relied on for differentiation, though sometimes the diagnosis could not be definitely assured even on the post-mortem table.

In summary, the pathological findings showed constant involvement of the pallido-nigral system. The substantia nigra suffered in all cases, paralleled by lesions of the *locus cæruleus*. The cellular changes were typical of a chronic parenchymatous process, with no distinguishing characteristics upon which to base a diagnosis, unless some outside findings such as perivascular infiltration or arterial changes were taken into account.

The authors feel that their findings show that the generally accepted view that neostriatum and pallidum are the most involved in the idiopathic cases and the substantia nigra in the post-encephalitic must not be too slavishly adhered to in an attempt to differentiate. The diffuseness of the encephalitic changes, the widespread secondary changes in the arteriosclerotic, and the generalized degeneration in the idiopathic render any correlation between

the clinical and anatomical findings almost impossible.

Whereas the clinical course depends largely on the underlying pathological process, the symptomatology does not depend entirely on the structural changes found after death. Many cases of clinical Parkinsonism show no discernible changes after death. There is altogether too little definite information as to the effects of disturbance of function and their relation to structural changes in the neural mechanism as the basis of extra-pyramidal disease, and this is especially true of Parkinsonism.

G. N. PATERSON-SMYTH

HYGIENE AND PUBLIC HEALTH

A Septic Sore Throat Epidemic. *Can. Pub. Health J.*, 1931, **22**: 224.

We here review a leash of papers dealing with the epidemic of septic sore throat which occurred at Kirkland Lake, Ontario, in December last, and which received much attention by the lay press at that time. The first paper, an epidemiological study by A. L. McKay and R. P. Hardman, sets forth the findings in an outbreak which assumed serious proportions in the week ended December 5th, reached its peak in the following week, and then rapidly subsided. The data of 457 cases, of which four resulted fatally, are analyzed. Milk from a particular dairy was incriminated and its distribution forbidden; and later the evidence amassed pointed to the milk from a portion of the udder of one cow as the main source of infection. Reasons were found for suspecting that the cow was infected by the *S. scarlatinæ*. The great majority of infected families showed multiple cases. The incidence was greatest in the age group 20 to 30. The epidemic was promptly controlled by stopping the sale of unpasteurized milk. The clinical findings are discussed by R. H. Armstrong. Abruptness of onset was very common, leading many patients to believe that they had been poisoned. A sharp rise of temperature and pulse rate, with redness, swelling and œdema of the throat and flushing of the face were commonly noted. The uvula was frequently greatly swollen. In many cases the lymph glands were swollen, most frequently those of the anterior cervical chain, and they sometimes suppurated. A septic type of temperature, coupled with evidence of infection of other organs, indicated infection of the blood stream in some cases. Complications were mainly arthritic and cardiac. Five per cent of those affected are left with permanently damaged hearts.

An elaborate bacteriological investigation, reported by A. L. McNabb, F. H. Fraser, and D. R. Fraser, cannot be summarized briefly. Among the findings we note: (a) milk samples from 85 cows (all dairies) yielded 17 strains of beta hæmolytic streptococcus, of which 2 (from cows belonging to the incriminated dairy) belong to a group assumed to be of human origin; (b) cultures from 20 cases of septic sore throat yielded beta hæmolytic streptococci; (c) similar streptococci were isolated from 15 of 30 milk handlers and members of their families; (d) 5 strains from patients and 1 strain from the child of a milk producer yielded toxin which could not be differentiated from toxins of scarlet fever strains, and of the toxins tested all were neutralized by scarlet fever antitoxin.

W. H. HATTIE

Diphtheria Immunization at Work. Chesney, G.,*J. Roy. San. Inst.*, 1931, **51**: 607.

For eight years (1921 to 1928) the diphtheria attack rate of Poole averaged 0.57 per 1,000 population—little more than a third of the rate for England and Wales and about a fifth of the rate for London. But in 1929 the rate was 4.25—nearly three times that of England and Wales and nearly 60 per cent greater than that for London. This experience, in Chesney's opinion, does not support the view that, where diphtheria is almost unknown, general immunization is unnecessary— "a short-sighted policy, and one destined to lead sooner or later to a destructive recoil on the community". Chesney argues that the absence of the herd-immunizing effect of endemic infection in an area deprives the community of the opportunity of gradually acquiring a natural resistance through repeated subinfections, so that the proportion of susceptibles rises to a point which makes a widespread outbreak likely, should infection be introduced. The Schick test showed 81.3 per cent of Poole elementary school children of ages 10 to 14 to be susceptible. In London children of similar grouping, 45.8 per cent were susceptible, while in some congested London areas the number of susceptibles was under 30 per cent.

The outbreak at Poole led to the establishment of immunization clinics, with results comparable to those which have now become so familiar. An interesting question was raised. "Does immunization tend to increase the number of carriers and consequently to create a greater danger to the non-immunized children?" Chesney points out that the contact carrier, as compared with the convalescent carrier, is relatively non-infective, and the immunized child is unlikely to become a convalescent carrier.

Chesney makes a striking comment on the financial aspect of immunization. On the basis of an average cost of £15 for each case of diphtheria in Poole during 18 months, he estimates that the amount spent on treatment was sufficient to cover the cost of immunizing the whole child population of the borough, and to provide also a capital sum which would yield sufficient interest to pay the recurrent annual cost of

protecting the yearly addition to the child population.

W. H. HATTIE

Levels of Life and Vitamin Tides. Price, W. A., *Am. J. Pub. Health*, 1931, **21**: 605.

Price asks why the mortality rates for certain diseases follow such similar seasonal curves in various parts of the world. He concerns himself with pneumonia and heart disease, the mortality from which is greater in winter than in summer, and finds that the fat-soluble vitamin content of milk and milk products is higher in summer than in winter. In other words, when the vitamin curve is low the mortality curve is high. Since dental caries is the most universal disease, Price paid close attention to it. Two groups, each composed of 20 "teen-age" persons, were studied. In the first group, on ordinary diet during the winter, 143 cavities were found in the late spring or early summer. In the second group, on a diet supplemented by additional vitamins, only three cavities were found. These observations have led to some conclusions, among them one to the effect that plant life should be improved through improvement of soil conditions "for the improvement of the nutrition of the foster mothers—the dairy animals—around which our civilizations have been built."

W. H. HATTIE

Sex Differences in the Physical Impairments of Adult Life. Britten, R. H., *Am. J. Hyg.*, 1931, **13**: 741.

In previous studies in the diseases of adult life, Britten analyzed the data obtained in examinations of a large number of men made at the instance of the Life Extension Institute. In this paper similar examinations of nearly 12,000 women are analyzed, and the findings in the two sexes are compared. The material has the defect of including a disproportionately small number of persons in the lower economic and social grades, and other factors may affect the validity of the conclusions, but the relative comparison between sexes has considerable meaning. A number of charts, indicating the prevalence of different conditions in each sex at various ages, show that the percentages of women in the different age groups run closely parallel to those of men. Thirty-five conditions are listed in which the women's rates are higher, those in which the ratios are highest being, in order, simple goitre, hypothyroidism, toxic goitre, visceroptosis, œdema, tenderness in region of gall bladder, adenitis, varicose veins, organic valvular lesions, suspected tuberculosis, low specific gravity of urine, functional murmur or irregularity, rapid pulse rate, intermittent pulse and extra systoles, hæmorrhoids. Among the conditions found more frequently in men those of greatest moment would appear to be granular and hyaline casts in the urine, arterial thickening, high specific gravity of urine, frequent colds, pyorrhœa, traces of sugar. The rates of physical impairment are, on the average, higher for women than for men, although the reverse is true of mortality data.

In the absence of data relative to child-bearing, an endeavour is made to estimate the influence of child-bearing by comparison of women listed as housewives, with other females. In this comparison, housewives are found to be considerably more prone to diseases of the uterus, carious teeth, infected gums, varicose veins and hæmorrhoids, while "all others" are more prone to frequent "colds" and naso-pharyngitis.

W. H. HATTIE

The Spermicidal Powers of Chemical Contraceptives. Baker, J. R., *Am. J. Hyg.*, 1931, **31**: 189.

Baker presents a study of the killing effect of 36 chemical substances on guinea-pig sperms. Laboratory methods were used, the technique followed being too elaborate for epitomizing. It was found that good germicides are not necessarily good spermatocides; that certain active spermatocides are unsafe on account of their poisonous properties; and that some contraceptives, such as pessaries containing quinine bisulphate, widely used despite their unreliability, have relatively low spermatocidal power. Soaps, on account of their power of reducing surface tension, are destructive of sperms. Sodeum oleate kills in one-thirty-second per cent and is sixteen times as spermatocidal as quinine bisulphate, but pessaries containing this substance were found to be harmful to rabbits. Baker makes the interesting suggestion that the fall in the birth rate of the wealthier classes in late years may be correlated with the more general use of the bath, as weak soap solutions have contraceptive power. Pessaries containing foaming mixtures might be expected to be more actively spermatocidal than non-foaming pessaries, by causing a more general spread of the spermatocidal substance. The ideal contraceptive has not yet been found. There is need for cooperation of physiologist, chemist and histologist in devising a satisfactory product.

W. H. HATTIE

THERAPEUTICS

The Effect of Caffein on the Cerebrospinal Fluid Pressure. Denker, P. G., *Am. J. M. Sci.*, 1931, **181**: 675.

Denker has measured the effect of a hypodermic injection of five grains of caffein sodium benzoate upon the cerebrospinal fluid pressure in 50 cases, 7 of which showed an increased intracranial pressure. The cerebrospinal pressure was measured manometrically by inserting

a needle into the fourth lumbar interspace and leaving it there for the space of one hour, during which time pressure readings were determined every five minutes. As soon after the puncture as a constant pressure level was established, the drug was injected into a vein, having first been diluted with a sterile solution of 20 minims of water. The respirations and the blood pressure were also noted at the time when the readings on the spinal fluid pressure were made.

In 49 of the 50 patients studied a definite decrease in the cerbrospinal fluid pressure was noted after caffein injection, while in a series of 10 control cases no such drop occurred. The average fall in pressure for the 50 cases was 36 per cent, the maximum being 68 per cent and the minimum 8 per cent. The drop in pressure began within two minutes after the injection of the drug, reached its maximum in 4 to 6 minutes, and returned to normal in about 37 minutes. No appreciable difference was noted in the fall of pressure in the cases with increased intracranial pressure and in those with a normal pressure. The methods by which caffein reduces the cerebrospinal pressure are discussed. The effect is partly due to the diuretic action of the drug which causes a partial dehydration of the brain and a consequent lowering of the fluid pressure, and partly due to its action as a powerful respiratory stimulant. Caffein by its respiratory stimulation causes a blowing off of carbon dioxide, and this elimination of carbon dioxide results in a decreased secretion of spinal fluid. These experiments find their clinical application in the treatment of headache. The empirical observation has been made that fairly large doses of caffein are effective in headache due to migraine, neuralgias, etc. This holds for headache due to any clinical condition causing increased intracranial pressure, such as cerebral hæmorrhage, brain tumour, or fracture of the skull. Denker suggests that the explanation for this empirical observation is that there is a lowering of the intracranial pressure, as in the experiments which he has carried out. At the Bellevue Hospital caffein is now in routine use in the neurological service as a temporary measure for reducing the symptoms resulting from increased intracranial pressure. Denker further suggests that the drug may be used with good effect in the headaches due to arterial hypertension and perhaps other diseases with the exception of that associated with chronic nephritis.

E. S. MILLS

The Maintenance Dose of Potent Material in Pernicious Anæmia. Beebe, R. T., and Lewis, G. E., *Am. J. M. Sci.*, 1931, **181**: 796.

Beebe and Lewis have studied 108 patients with pernicious anæmia in an effort to determine the maintenance dose of liver as a potent substitute. As a result of this study they have been able to divide the 108 cases into four groups depending upon their response to therapy. In group 1 are 64 patients who maintained a normal blood level on relatively small amounts of an effective substance, that is on the equivalent of 240 grams of liver per day. The average age of these patients was 45 years. In this group only 38.19 per cent had neuromuscular symptoms and 85.74 per cent of these showed improvement under treatment. In the second group were 31 patients whose average age was 60 years and who required up to 800 grams of liver or its equivalent in order to maintain a relatively normal blood level. Of these 45.16 per cent had neuromuscular symptoms and only 57.14 per cent improved with treatment. In the third group were 5 cases whose average age was 69 years. From 450 to 800 grams of liver or its extract daily failed to maintain a normal erythrocyte level and 80 per cent had neuromuscular symptoms. On treatment only 20 per cent showed any improvement. The eight patients in the fourth group did not respond satisfactorily on even large doses of liver or liver extract but improved when iron as well as liver or liver extract was given daily.

The conclusions reached by the authors are that some patients require much more potent substance than others in order to maintain a normal blood level; that neuromuscular changes may improve if the blood is maintained at a normal level or advance if it is not; and that iron as well as a potent liver substance may be necessary in a few cases to keep the erythrocyte level normal.

E. S. MILLS

Iodine in Exophthalmic Goitre. A Comparison of the Effect of Ethyl Iodide and Potassium Iodide with that of Lugol's Solution. Lerman, J. and Means, J. H., *Am. J. M. Sci.*, 1931, **181**: 745.

Lerman and Means have treated cases of exophthalmic goitre with ethyl iodide and others with potassium iodide. The results obtained were comparable in all respects to those when Lugol's solution is used. After a period of bed rest to stabilize the metabolic rate ethyl iodide was administered to 25 patients by the inhalation method in doses of from 2 to 4 grams per day. The treatment was continued until the basal rate again reached a level, which usually required from seven to fifteen days. No untoward results were obtained if the drug was inhaled slowly over a period of twenty minutes. A similar procedure was carried out on 18 patients, employing potassium iodide by mouth instead of ethyl iodide. The daily dose was from 3 to 6 grains daily.

Each drug produced a fall in the basal meta-

bolic rate comparable to that expected from adequate doses of Lugol's solution. The post-operative course in these patients did not differ from that when Lugol's solution is used during the preoperative period. The conclusion reached is that iodine produces its characteristic changes in exophthalmic goitre independently of the type of iodine compound or the route by which it gets into the body. The authors prefer potassium iodide to Lugol's solution in the treatment of exophthalmic goitre because it is as effective as other iodine compounds and is much less offensive to take.

E. S. MILLS

ANÆSTHESIA

Avertin Anæsthesia in Neurolgic Surgery. Dandy, E., *J. Am. M. Ass.*, 1931, **96**: 1860.

The use of avertin anæsthesia is strongly advocated by the author for all major operations on the brain and spinal cord. In a series of 250 cases of major cranial operations of every type, there was no mortality due to the anæsthetic, no post-operative pneumonia, and nausea and vomiting occurred infrequently. The swelling of the brain, as obtained in ether anæsthesia, is entirely absent. Because of this, the author has found it possible to modify the magnitude of the exposure to a high degree. The danger of extradural hæmorrhage is eliminated, and the smooth and even respirations which follow avertin anæsthesia, greatly facilitate operative procedures. The mortality rate, which occurred in previous use of avertin was due most probably to an overdosage, in attempts to induce anæsthesia with avertin, unsupported. It should be treated as a basal anæsthetic, and if the average dose does not produce enough anæsthesia, any deficit may be overcome by supplementing a small amount of ether, nitrous oxide, or a local anæsthetic.

Pulmonary lesions, chronic nephritis and hypertension are apparently not contraindications to the use of avertin. It has been given in patients up to the age of 80 with no ill effects. In young children under the age of 8 or 10 ether is preferred, as the amount required is small. One disadvantage of avertin is a drop in blood pressure which occurs usually within the first half hour. The patient's general condition, however, remains unchanged, and as a rule, in a short time, the blood pressure regains its normal level. A secondary fall does not occur.

DOROTHY M. TEGGART

THE PROLONGATION OF LIFE.—"This is a new part" of medicine, "and deficient, though the most noble of all; for if it may be supplied, medicine will not then be wholly versed in sordid cures, nor physicians be honored only for necessity but as dispensers of the greatest earthly happiness that could well be conferred on mortals."—Bacon, *The Advancement of Learning.*

Obituaries

Hon. Dr. Robert Allen Pyne, Sheriff of Toronto, and for many years a notable figure in the public life of Toronto and the Province, died suddenly on June 18, 1931, at his home, 161 Indian Road, Toronto, in his seventy-eighth year. Dr. Pyne was apparently in excellent health when he arose, but members of his family said he had received warnings recently from his personal physician regarding the condition of his heart. He had been down at his office every day. His unexpected

Hon. Dr. Robert Allen Pyne

death came as a great shock to the court officials at the City Hall and Osgoode Hall, and also at the Parliament Buildings.

From his earliest days Hon. Dr. Pyne was an enthusiastic supporter of the Conservative Party. In the days when the Ross Government was fighting for its very life in Ontario and a number of election protests were before the courts and upon their result depended future Conservative success, Hon. Dr. Pyne supplied the funds for expenses. His party services were afterward publicly acknowledged by Sir James Whitney, who made him Minister of Education when the party came into power in 1905.

The late Dr. Pyne was a member of the Ontario House for 20 years, representing seats in East Toronto. From 1880 to 1907 he was Registrar of the Ontario College of Physicians and Surgeons, and for many years was on the Board of Education, with one year as Chairman. He practised his profession on Gerrard Street at Berkeley Street. His vigorous and many-sided life included a strong devotion for military affairs. A year after the Great War broke out he was gazetted a Lieutenant-Colonel of the Army Medical Service, and an Honorary Colonel of the Canadian Militia. That same year Ontario gave a hospital to the allied forces and Hon. Dr. Pyne was sent to England to complete its organization at Orpington. Thousands of wounded soldiers passed through this hospital, on the staff of which were many well-known Canadian doctors. He was

known as a staunch Orangeman and worked in and out of the Ontario Legislature against bilingualism.

Old friends of Hon. Dr. Pyne unveiled a portrait of him at the Albany Club three years ago. In proposing a toast, H. C. Schofield, M.P.P., President of the club, said that Dr. Pyne, in public life, had a kind, gentle word for everybody and that his opponents always said he fought a fair battle.

Hon. Dr. Pyne was a native of Newmarket and a graduate in medicine of the University of Toronto (1878). Surviving are three children, Mrs. Mona Colling, Fred R. Pyne and Frank H. Pyne, all of Toronto. Lord Roberts, British Commander in the South African War, was a cousin.

Dr. Calvin Alfred Ames, of Toronto, aged 51, died on July 6th, from heart disease. Born in Quebec, he graduated in medicine from McGill University in 1902 and practised his profession for ten years in Newfoundland prior to the outbreak of the Great War. He served overseas for four and a half years and on returning was a patient at the Soldiers' Hospital in Newmarket, following which he resided in the town for nine years. For a short time he was physician at the Jail Farm, Lansing, but had been for the last two years associated in practice with Dr. W. Morrison. The deceased is survived by his widow and three sons.

Dr. Adam Scott Beuglas, of Hamilton, Ont., died at his late residence, on July 5, at the age of 77 years.

Dr. David Hawthorne Gould, of Fenelon Falls, Ont., died recently (June). He was in his eightieth year, and had lived in the village virtually all his life, with the exception of the time spent at Cambray, Ont., and in Toronto. Several years ago he succeeded H. J. Lytle as proprietor of the drug store, now operated by Alvin Gould, a son. Dr. Gould was a Conservative, but left the party some years ago over the temperance question. Dr. Gould was born in 1852 and graduated from the University of Toronto in 1879.

Dr. Thomas Bennett Green, a practising physician and surgeon in New Westminster since 1906, passed away at his residence in that City on June 5 after an illness due to heart trouble. Although he had been in failing health for several months, he was confined to his bed only a week before the end.

Thomas Bennett Green was born in Listowel, Ont., in 1874, a son of James Green, formerly of Wick, Scotland. In 1889 the family moved to Virden, Man., where at the age of 16, having obtained a second class teacher's certificate, he began teaching school. At 17 he was granted special permission to enter the University of Manitoba and in 1899,, after alternating periods of teaching and studying, he received his B.A. with honours in mathematics. In 1900 he came to New Westminster, and after two years of teaching school he resigned to devote his life to the study of medicine. He graduated from McGill University in 1906 and returned to British Columbia. In the fall of that year he married Mary Lloyd, daughter of Mrs. J. B. Kennedy, of New Westminster, and the first eight months of his career as a medical man was spent at Lillooet, B.C. He then moved to New Westminster and subsequently became a partner of the late Dr. R. E. Walker, with whom he was connected until the latter's death. A short time later Dr. W. A. Clarke joined him and they worked in partnership until Dr. Green's demise. Dr. Green saw active service overseas during the Great War. In 1915 he joined No. 5 Canadian General Hospital Unit, organized at Victoria under Col. Hart, and proceeded to Salonica. The major part of 1917 he spent in England with the Canadian Red Cross hospital at Taplow, on the estate of Lady Astor. On his return from overseas he continued his work as a medical officer for some time in connection with the S.C.R. At the time of his death he was physician to the Provincial Penitentiary and to the C.P.R. He was member of the Kiwanis Club, the I.O.O.F., and the Masonic Order.

Surviving him are his wife, a daughter, Lillooet, and a son Lloyd; two brothers, Harry E., of Fleming, Sask., and George A., of Edmonton; and two sisters, Mrs. John Whiteford, of Cranbrook, and Mrs. Lee Buker, of Virden, Man.

Dr. Green was a member of the Canadian Medical Association, the British Columbia Medical Association, and the Fraser Valley Society; he was also an Associate Member of the Vancouver Medical Association. He had served as an examiner for the Medical Council of Canada. He was a member of the first commission on Health Insurance in British Columbia. He will long be remembered as a keen conscientious practitioner who was, at all times and above everything else, interested in the welfare of his patients. He was of the type which it has become the fashion to call "old school", with clear-cut, definite views on the profession and on everything affecting it. On these matters he was always ready to state his views and if necessary to defend them. He will be sorely missed, not only by his patients but by his colleagues and all who knew him. His passing is a distinct loss to medicine in British Columbia.

Dr. Ewen McEwen, of Smith's Falls, Ont., died in the Public Hospital, at the age of 76 years. He was born at Franktown, Ont., and was a member of one of the oldest families of Beckwith Township. His parents were the late Mr. and Mrs. Ewen McEwen, of Franktown, the former being postmaster there. He was a graduate of Queen's University, Kingston (1887). He practised medicine in Carleton Place for a number of years and afterward went to Port Arthur, where he remained until 1914, when he came to Smiths Falls, and since had lived a retired life. He leaves one brother, John McEwen, barrister, of Smiths Falls.

Dr. J. K. McLennan, a graduate of Manitoba Medical College in 1894, died on May 29th at Moravia, California. The late Dr. McLennan was a native of Glengarry County.

Dr. Julia Thomas, of Toronto, died on June 28. She was a graduate of Trinity University (1892).

Dr. James Thompson Whyte died in Carman Hospital at 9.30 p.m. June 15 of injuries received two hours earlier when his care overturned. His wife, was was with him at the time, was seriously injured.

Dr. Whyte, who was born in Ontario, was a graduate of McGill University in both arts and medicine (1893). On graduation he began practice at Killarney, Man., where he remained until he moved to Winnipeg in 1907. During the war he served for two years with the Royal Army Medical Corps, attached to an Imperial unit. For a time he was on the Salonika front.

At the time of his death he was a director and treasurer of Victoria Hospital. About 1912 he was one of the founders of the *Western Canada Medical Journal*, one of the pioneer medical publications of the West.

In language the whole intellectual and moral essence of a man is to some extent revealed. "Speak, and you are" is rightly said by the Oriental. The language of the natural man is savage and rude; that of the cultured man is elegant and polished. As the Greek was subtle in thought and sensuously refined in feeling—as the Roman was serious and practical rather than speculative—as the Frenchman is popular and sociable—as the Briton is profound and the German philosophic—so are also the languages of each of these nations.—D. Jenisch.

News Items

Great Britain

Dr. John Carswell.—We regret to announce that Dr. John Carswell died on June 20, 1931. He was the first physician in Great Britain to establish the institutional treatment of mental disease on a hospital basis without certification, and was a distinguished figure in the group of British alienists upon whose work the recent amendments of the lunacy laws in this country were based . His pioneer work in Glasgow in the "eighties" attracted widespread attention and led to similar experiments in other parts of the country. The foundations were thus laid for the present-day hospital treatment of early and acute mental diseases.

John Carswell was born in Glasgow in 1856, of West Highland stock. He studied medicine in Glasgow, qualified in 1877, and was for some time assistant to Dr. Rutherford, then of Woodilee Asylum, later of the Crichton Royal Institution, Dumfries. Rutherford was a pioneer of the abolition of restraint, and it was from him that Carswell acquired his earliest ideas about the treatment of insanity. He began to apply these ideas while acting on behalf of the old Barony parish in Glasgow. Later, on a tentative basis, he opened some wards in connection with the poor-law hospital.

The success of this experiment over a period of 15 years encouraged the united parish of Glasgow to establish up-to-date wards for the treatment of insanity in one of their new general hospitals, and Carswell was appointed consulting physician to these wards. In 1914 he was appointed a Commissioner in Lunacy and Mental Deficiency for Scotland. During his retirement he was a frequent contributor to professional journals.

British Medical Association, Centenary Meeting, 1932.—The Centenary Meeting of the Association, a very important landmark in its history, will be held in 1932, under the Presidency of Lord Dawson of Penn, commencing with the visit to Worcester, on Sunday, July 24th, with which is combined the official Religious Service. It is hoped that there will be a large attendance of members of the Association, both home and overseas; also of official delegates of kindred Associations throughout the world.

Advantage will be taken of the pilgrimage to Worcester to celebrate the founding of the Association there in 1832 to unveil a memorial in commemoration of the Founder, Sir Charles Hastings, and to this event the Presidents and Chairmen of all Branches and Divisions will be specially invited. The memorial will probably take the form of a stained glass window in the cloisters of the Worcester Cathedral, and a tablet on the house in Worcester formerly occupied by Sir Charles. The Council intends shortly to make an appeal for subscriptions for the purpose of this memorial, and hopes for a ready response from all members of the Association. Any balance left over after the provision of the above-mentioned memorials will be handed to the Sir Charles Hastings Fund.

The Gold Medal of the British Medical Association.—It is announced that the Gold Medal of the British Medical Association has been awarded to Mr. N. Bishop Harman, the Treasurer, in recognition of his distinguished work in ophthalmology and his valuable services to the British Medical Association; and to Dr. Alfred Cox, the General Secretary, for his great qualities, which have been indispensable to the Association. The awards will be formally made at the Annual General Meeting.

Dr. Griffith Evans.—One of the oldest living graduates of McGill is Dr. Griffith Evans, Med. '64, upon whom the freedom of the city of Bangor was recently conferred. The British Medical Association reports that Dr. Evans, now in his 96th year, has been a member since 1874. He discovered in India that surra, a disease of horses and cattle, was caused by a trypanosome, to which the name "Trypanosoma evansi" was subsequently given. For his devotion to science, Dr. Evans was awarded the Mary Kingsley medal of the Liverpool School of Tropical Medicine.

Glasgow Post-Graduate Medical Association.—The following arrangements have been made for post-graduate teaching in Glasgow during the summer of 1931: (*a*) A general medical and surgical course from August 17th to September 11th. (*b*) Clinical assistantships in general and special hospitals. Further information may be obtained from the Secretary of the Association, The University, Glasgow.

The Hospital of St. John of Jerusalem.—The King has sanctioned the following promotions in and appointments to the Venerable Order of the Hospital of St. John of Jerusalem:—Knight of Justice: Col. Sir James Purves-Stewart. Knight of Grace: Col. the Hon. Murray MacLaren. Commanders: Maj. Sir Thomas Houston, Dr. E. A. Chill, Sir P. Horton-Smith Hartley, Lt.-Col. H. J. Barnes, Dr. R. Clegg, Dr. F. N. Kay Menzies, Surg.-Vice Admiral Sir Arthur Gaskell, and the Hon. J. H. King, M.P. Officers: Lt.-Col. G. E. Peacock, Lt.-Col. G. Mackie, Capt. A. C. W. Knox, Dr. W. E. Thompson, Dr. W. Wilson, and Sir Squire Sprigge. Serving Brothers: Dr. W. Lee, Dr. L. A. Line, Dr. F. S. Booth, Dr. L. Featherstone, Dr. C. A. Verco, Dr. W. G. Shellshear, Dr W. B. .A. Moore, Dr. D. H. Griffiths, Dr. R. L. E. Downer, and Lt-Col. G. C. E. Simpson. Associate Serving Brothers: Major Sorab Kaikhorsu, Engineer, and Dhanjibhai Hormasji Mehta.

Dr. J. A. Campbell Kynoch, Emeritus Professor of Obstetrics at St. Andrews University, died suddenly on June 23rd. He was a graduate in medicine of Edinburgh University, and studied midwifery and gynæcology in Berlin, Vienna, Bonn, and Munich. He was the first Professor of Midwifery appointed when the Conjoint Medical School was established in Dundee and for many years was Dean of the Faculty of Medicine at St. Andrews University.

Alberta

A special Commission was appointed at the last session of the Provincial Legislature, largely through the request of the Labour Party, to ascertain whether any change in favour of workmen is reasonably possible. The reason for this procedure was that an important question was brought before the Legislature pertaining to the right of a workman to appeal from the findings of the Compensation Board to a court of justice. The Commission will meet about the middle of July. A representative of the council of the College of Physicians and Surgeons will attend this meeting to follow the discussions.

The annual meeting of the Alberta Medical Association will be held in Calgary on September 16, 17, and 18. The following representatives from British Columbia have signified their intention of taking part in the program: Drs. C. F. Covernton, T. H. Lennie, and G. F. Strong.

The Provincial Department of Health reports the following cases of infectious diseases for March:—Measles 190; chickenpox 43; pulmonary tuberculosis 18;

whooping cough 6; German measles 4; mumps 42; erysipelas 2; scarlet fever 58; diphtheria 15.

The Alberta Hospital regulations state that "in connection with major operations the anæsthetic is to be administered by a physician, unless permission is otherwise given by the superintendent of the hospital." "The surgeon performing a major operation shall have as an assistant a medical practitioner." These regulations seem to be simple when applied to the city hospitals but have a quite different aspect when applied to the rural hospitals, where in some instances there is only one physician in the town or village, and where other physicians can only be obtained from a distance of twenty miles or more to act as assistant or anæsthetists. The superintendent of the smaller hospitals is, more often than not, a senior nurse. In some rural hospitals it is customary to have a physician administer the anæsthetic and have a nurse assist at the operation. Many medical men feel that the regulations should be reversed so that if one physician should be dispensed with it should be the assistant at the operation and not the anæsthetist. The question naturally arises to what extent should other than emergency operations be allowed unless three physicians are available.

The Council of the College of Physicians and Surgeons went on record some time ago to the effect that no building should be called an hospital unless and until the minimum equipment be provided; in the meantime such will be known as nursing homes. It is said that the Provincial Department of Health is considering the restriction of certain types of operations to the larger centres where facilities and surgical experience are more likely to be available, thus enhancing the chances of the patients.

At the annual meeting of the Alberta Health Workers Association, held at Edmonton, the following officers were elected for the ensuing year; *President,* Dr. Geraldine Oakley, who succeeded Dr. M. R. Bow, Deputy Minister of Health; *Vice-president,* Dr. A. M. Lafferty, Lethbridge; *Secretary-treasurer,* Dr. R. B. Jenkins, Edmonton. The Association will hold the next meeting in Calgary in 1932.

Of interest is the following as showing the trend of public opinion in rural centres. At a meeting of the High River Municipal Hospital Board held recently the following resolution was passed "That the approval of the Minister of Health be asked to a change of scheme, whereby, instead of the district nurse or any other service heretofore provided at Blackie, the High River Hospital District contribute to the maintenance of a physician, resident of Blackie." During the past spring the sub-hospital at Blackie was closed. This had been operated for a number of years in conjunction with the municipal hospital at High River.

A delegation representative of various municipalities and towns in the High River District met the hospital Board to ask for a flat rate of one dollar a day for indigent patients from the contributing areas, the same to be charged to the municipalities concerned.

For the first time in connection with the Canadian Medical Association's extra-mural post-graduate scheme there will be a tour of the Peace River District during the early part of August, when Dr. A. E. Archer, of Lamont, Alberta, who is president of the Council of the College of Physicians and Surgeons, and Dr. D. B. Leitch, professor of pædiatrics at the University of Alberta, will make a tour of this district in company with Mr. W. G. Hunt, associate secretary of the Alberta Medical Association. Meetings will be held at Peace River and Grande Prairie. G. E. LEARMONTH

British Columbia

The records of the Graduate Nurses Association show that this year, 82 nurses have graduated from the Vancouver General Hospital; 26 from St. Paul's Hospital, Vancouver; 35 from the Provincial Royal Jubilee Hospital, Victoria, and 30 from St. Joseph's Hospital, Victoria. In addition, it is estimated that approximately 120 have completed courses in the smaller hospitals throughout the province, making a total of about 300 new graduates. It is known that about 900 young ladies are at present training in the province.

Under existing conditions there is insufficient work for this steady and rapid augmentation of an already over-crowded profession, and the future is causing serious concern.

A new wing on St. Paul's Hospital, Vancouver, is rapidly nearing completion, and it is expected that it will be occupied by the end of August. The new structure is four stories high, and conforms in architecture to the main building. On the main floor new x-ray and other laboratories will be placed. The entire top floor will be used for operating rooms, eleven theatres being provided. As the program calls for the demolition of the old wing, built in 1894, and containing 100 beds, the actual increase of beds will amount to only about 30, but there will be great relief of overcrowding in the administrative and allied services.

On July 9th Prof. John H. Stokes, of the University of Pennsylvania, addressed a special meeting of the Vancouver Medical Association on the "Eczema, Asthma, Hay-fever Complex," the lecture being illustrated with lantern slides.

The Public Health Laboratories of the Provincial Department of Health, which have been housed at the Vancouver General Hospital, are being established in separate quarters near the Court House. The laboratories, which serve the lower mainland, as well as Greater Vancouver, will be freed of a great deal of the routine work of the hospital, and it is expected will be more useful to the community at large.

An order-in-Council has recently been passed in British Columbia, making cancer a notifiable disease. Cancer Clinics have been established in both hospitals in Vancouver, and a campaign is being organized to secure government aid in the control of cancer.

C. H. BASTIN

Manitoba

Dr. G. F. Stephens, Superintendent of the Winnipeg General Hospital, has recently returned from a meeting of the Minnesota Hospital Association at Duluth, where he gave an address on Social Medicine.

A meeting of the North-Western District Society was held at Russell on July 22. Dr. T. G. Hamilton addressed the afternoon meeting on "Injuries of the hand" and a public evening meeting on "Psychic phenomena."

The Manitoba physicians who attended the Vancouver meeting of the Canadian Medical Association are enthusiastic in their praise of the meeting.

A refresher course for nurses is being held in the University of Manitoba.

Dr. L. G. Montgomery (Man. '31), Ninette Sanatorium, Man. has been awarded $100 by the Canadian Tuberculosis Association for a thesis based on work

and studies he had carried out while engaged at the sanatorium. His contribution was "A study of tuberculosis in Indian children." ROSS MITCHELL

New Brunswick

Dr. and Mrs. Harvey Smith, of Winnipeg, were guests in Saint John recently for the Smith-White wedding.

Dr. Edward Broderick, son of Dr. E. J. Broderick, of Saint John, is visiting his parents after completing a year's internship at the Quincy Massachusetts City Hospital.

Dr. G. A. B. Addy, of Saint John, was one of the special speakers in a series of addresses given to the pupils of the Vocational School along the line of Vocational Guidance. Dr. Addy discussed the profession of medicine, its opportunities for students, and particularly its difficulties.

Dr. Mabel Hannington, of Saint John, was elected Vice-President of the National Council of Women of Canada at the meeting in Moncton in June.

Dr. G. B. Peat was elected to the Presidency of the New Brunswick Command of the British Empire Service League, at their annual meeting in Campbellton.

At the recent examination set by the Council of the New Brunswick Medical Society for the privilege to practise in New Brunswick, only one candidate presented himself. This small number is due to the fact that practically all recent graduates are taking the examinations for the Dominion Council, which is as it should be. It is to be hoped that shortly the examination of the Dominion Council will be the only method of entry to the profession in this Province.

The newly appointed house staff at the Saint John General Hospital includes: Drs. F. R. Connell, W. J. Baxter, C. A. Dahlgren, G. F. Kincade, from McGill, and Drs. W. J. Murphy and F. C. Jennings, from Dalhousie.

Dr. J. P. McInerney and Dr. A. L. Donovan have begun practice in the city of Saint John on the completion of their two year's internship at the Saint John General Hospital.

Dr. Laughlan McPherson is still confined to bed at the Saint John Tuberculosis Hospital. He is making satisfactory improvement. A. S. KIRKLAND

Nova Scotia

Dr. A. S. Giffin has been appointed to the medical staff of the Nova Scotia Sanatorium, Kentville.

At the annual meeting of the Alumni Association of Dalhousie University, Dr. E. K. Maclellan was elected president, and Dr. H. B. Atlee was re-elected editor of the Alumni News.

Announcement has been made that the construction of an annex to the Sydney Civic Hospital, for the accommodation of tuberculosis patients, will begin very soon. Twenty-four rooms will be provided. The cost is to be $100,000.00.

Dr. A. H. Sangster has retired from his position on the resident staff of the Victoria General Hospital, and has been succeeded by Dr. C. M. Bethune. Dr. Sangster has gone to Edinburgh for a period of graduate study.

Under the provisions of an enactment of the last session of the provincial legislature, a commission has been appointed to supervise the administration of the Nova Scotia Hospital. This commission is composed of Hon. Mr. Justice Ross and Messrs. W. R. Powell and John S. Misener.

An arrangement has been effected by which a limited number of students in medicine at Dalhousie University will be accepted for six months' periods as undergraduate internes at the Saint John General Hospital. Only students who have completed the fourth year are eligible for such appointments. As a full interne staff has been engaged for the ensuing year, this arrangement will not become effective until next year.

The corner stone of the new building for the Halifax Infirmary was laid with fitting ceremony on the 25th of June. The Archbishop of Halifax, accompanied by a number of priests and others, marched in procession to the new structure, much of the frame work of which is already in place. After blessing the building, the Archbishop laid the stone, following which brief addresses were given by Hon. Dr. Murphy (who acted as chairman), the Lieutenant-Governor, the Premier of Nova Scotia, the Chief Justice, the Mayor of Halifax, and the Archbishop.

Classes of nurses have graduated recently from several Nova Scotian Hospitals. Particular interest attached to the graduation ceremonies of St. Martha's Hospital, Antigonish, where the graduates were addressed by Miss Beard, of the Rockefellel Foundation, Miss Smellie, Chief Superintendent of the Victorian Order of Nurses, and Hon. Dr. George H. Murphy, Minister of Health of Nova Scotia. At this hospital a prize has been established in the form of a scholarship providing for a special course in public health nursing.

The annual meeting of the Registered Nurses' Association of Nova Scotia was held at the Dalhousie Clinic on the 11th and 12th of June, under the presidency of Miss Margaret MacKenzie, of the Provincial Department of Health. An official welcome was extended by Mayor Ritchie. In addition to papers and discussions by members of the Association, an address by Mr. L. D. Currie, president of the Hospital Association of Nova Scotia and Prince Edward Island, was heard with much interest. Among the visitors were Miss Beard, of the Rockefeller Foundation, and Miss Smellie, of the Victorian Order of Nurses, both of whom addressed the Association at a dinner meeting held at the Nova Scotian Hotel. The entertainment included tea at the Nurses' Residence of the Children's Hospital and dinner at the Lord Nelson Hotel. Miss MacKenzie and Miss L. F. Fraser were re-elected president and corresponding secretary, respectively, and Miss A. M. Fraser was elected secretary for the ensuing year.

The annual meeting of the Hospital Association of Nova Scotia and Prince Edward Island was held at Windsor on the 9th and 10th of June, under the presidency of L. D. Currie, LL.B., of Glace Bay. There was a very good attendance, and a large amount of important business was transacted. On the morning of the first day the members were officially welcomed to Windsor by the Mayor, Dr. O. B. Keddy. Hon. Geo. H. Murphy, Minister of Health for Nova Scotia, outlined his policy for tuberculosis control, and asked the cooperation of the hospitals. Among others who gave addresses were Dr. Harvey Agnew, of the Canadian Medical Association's Department of Hospital Service, Miss Marion

Boa, of the Aberdeen Hospital, New Glasgow, Miss Mary Beard, of the Rockefeller Foundation, Miss E. L. Smellie, Chief Superintendent, of the Victorian Order of Nurses, Dr. J. G. MacDougall and Dr. H. L. Scammel, of the Victoria General Hospital, Halifax. Mr. L. D. Currie and Miss Anne Slattery were re-elected president and secretary, respectively. W. H. HATTIE

Ontario

At the recent convocation of the Senate of the University of Western Ontario, the degree of LL.D. was conferred on Dr. John A. Macgregor, Professor Emeritus of Medicine.

The present year sees the University of Toronto's first graduating class in Physiotherapy.

The Royal Commission recently appointed by the Provincial Government of Ontario to study the issue of radium and the treatment of cancer has visited a number of hospitals and universities in the United States. Late in June, the Commission proceeded to Great Britain and Europe. Dr. J. W. S. McCullough, Chief Inspector of the Department of Health, has been appointed Secretary of the Commission.

A very successful qualifying round in the Academy of Medicine Golf Tournament was held at Lakeview Golf and Country Club on Monday, June 15th. All the arrangements under the Chairmanship of Dr. R. E. Davidson were carried out satisfactorily. Most of the players stayed for the evening dinner at which the President of the Academy, Dr. Harris McPhedran, acted as Chairman. Unsuspected elocutionary and histrionic abilities of some of the younger Fellows and vocal capacities, especially of the Past Presidents, were discovered, much to the delight and amusement of all, and left one with the assurance that with a few such meetings in the year, there will be no danger of decay through "dry as dust" scientific discussions.

Dr. Horace Macintyre led the singing and Dr. S. L. Alexander, Dr. A. R. Hagerman and Dr. C. S. Macdougall were also outstanding contributors to the program.

The Western and Grace staff won the hospital competition. Sixteen qualified in the section with handicaps 1 to 20, and signified their desire to carry on with match play during the summer, and sixteen qualified with handicaps 21 to 32. The Golf Committee plans to have another Field Day in the autumn.

J. H. ELLIOTT

A ceremony unique in the history of the C.A.M.C. took place on Sunday, June 14, 1931, at Ancaster, Ontario, when there was presented to St. John's Anglican Church the Red Cross Flag carried by the Fifth Canadian Field Ambulance, British Expeditionary Force, during service overseas, 1914-1919, together with a Union Jack given by the Officers, Non-commissioned Officers and Men of the Ambulance in memory of their original Commanding Officer, the late Colonel George Devey Farmer, C.B.E., M.D.

The Fifth Field Ambulance of the Active List, Canadian Militia turned out at full peace strength, and about fifty members of the B.E.F. unit, augmented by about the same number of veterans, together with a large concourse of citizens took part in or witnessed the exercises, which were of a most impressive character, and were brought to a conclusion by the sounding of the Last Post and Reveille. At the conclusion of the service in the church, a procession was formed for the purpose of repairing to the grave of the late Colonel Farmer, where a wreath was deposited, while pipers played a lament. Much credit is due to the Rector, Major, The Rev. W. E. Kidd, M.C., C.F., for the admirable arrangements at the church, the impressiveness of the service being greatly enhanced by the fine music rendered by the choir.

Sixty-eight years after graduating in medicine from Victoria College, Toronto, Dr. William Philip is to be presented with a silver medal by the senate of the college, a medal which he won when he graduated, but which the medical college was unable to buy at the time. Dr. William Philip is 94 years old, and Hamilton's oldest physician.

In May, Dr. Philip was made an honorary life member of the Ontario Medical Association, at its meeting at Niagara Falls. He was present in person to receive the honour and, at the time he related to the doctors how he had won the silver medal in the class of 1863 of Victoria Medical School, Toronto, but that the University of Victoria College had not at the time sufficient funds to purchase it.

Members of the senate of Victoria College noticed in the paper Dr. Philip's account of the medal, and traced it in their records, finding that it was quite true. They decided to have a special medal struck for Dr. Philip, and he will be asked to attend the commencement exercises next Autumn and receive his award.

Quebec

Compensation will be made farmers of the Province for cattle destroyed because they were tuberculous will only be paid under certain conditions, according to the Dept. of Agriculture.

A letter, issued by J. Ant. Grenier, deputy minister, on instructions from Hon. Adelard Godbout, Minister of Agriculture, points out that for farmers located within anti-tuberculosis zones, and also for those whose herds are periodically inspected under the Health of Animals' branch of the Federal Department of Agriculture, the rate of compensation for slaughtered tuberculous cattle will be: pure bred and registered cows, two years old or more, $30; less than two years old, $20; cross-bred cows, two years old or more, $15; less than two years old, $10.

Contracts have been let for the new Jewish hospital, to be erected at Cote de Neiges and Cote Ste. Catherine Roads, Montreal. More than $1,500,000 have been pledged for the undertaking. The erection of a nurses' home will be deferred until the hospital is in operation.

The total cost of the hospital will be $1,175,000, which does not include some $150,000 for the purchase of the land. Already $200,000 has been spent in general disbursements and for the land, leaving the committee with $642,000 on hand to carry on the work and about $300,000 still to be collected in pledges extending over two years.

The building will contain an operating room and the most modern equipment securable, in addition to a radiography outfit of the latest design to assist in diagnosis and research. The outdoor department is planned to render rapid aid in emergency cases. The culinary department has been arranged for the strict observance of dietary laws.

Space has been provided for solariums at the end of each floor and on the roof. A power house will be constructed to take care of all present requirements and will provide room for future expansion in event of erection of more buildings and the proposed nurses' home.

Saskatchewan

Two of the three awards made by the Canadian Tuberculosis Association for theses have been awarded to Saskatchewan doctors. Dr. W. S. Barclay, of the Saskatoon Sanatorium, has been awarded $150 for his contribution under the title "A study of Tuberculosis contacts in families" and an award of $100 has been given to Dr. L. G. Montgomery for his contribution, "A study of tuberculosis in Indian children."

The staff of the Regina General Hospital were addressed by Dr. E. A. McClusker on "Upper respiratory infections" and by Dr. B. C. Leech on "The choice of Anæsthesia," at a recent meeting. The staff, working on the principle that any paper is boring after the first twenty minutes have asked the members not to speak longer than this, and in order to remind them of the passing of time an alarm clock rings at the end of that time. The prognosis in regard to that chronic complaint of medical meetings, verbosity, seems excellent.

A post-graduate team, consisting of Dr. L. J. Austin, of Queen's University and Dr. J. C. Meakins, of McGill, toured Saskatchewan in June. At Broadview in the afternoon Dr. Austin spoke on "Injuries and fractures in the region of the elbow joint," and Dr. Meakins spoke on "Chronic bronchitis, its etiology and cure," in the evening Dr. Austin took as his subject "The management of skull injuries," and Dr. Meakins spoke on "Coronary thrombosis." In Regina Dr. Austin spoke on "Aspects of medical history," and Dr. Meakins spoke on "Bronchitis".

The McGill graduates in Regina entertained at a lunch in honour of Dr. Meakins while he was in Regina. His Honour Lieutenant-Governor H. E. Munroe presided.

The Regina and District Medical Society was the recipient of a medical library donated by Mrs. George J. Whetham in memory of her late husband, Dr. George J. Whetham. The gift consisted of three hundred and fifteen medical volumes which had belonged to Dr. Whetham, library furniture, and steel engravings. Until the medical society has its own rooms the library will be kept in the Regina General Hospital. At a presentation service held on June 26 Dr. R. R. Roger spoke on behalf of the medical society, Mr. P. Hyde spoke on behalf of the Board of Governors; Dr. E. B. Alport recalled the fine characteristics of the late Dr. Whetham and Dr. S. R. D. Hewitt spoke of the pleasure of the hospital staff in having a library within the hospital walls.

LILLIAN A. CHASE

General

Sir William R. Smith.—At the Congress of the Royal Institute of Public Health, held in Frankfurt-am-Main, last May, the Ehrlich-Weigert Medal of the University of Frankfurt was bestowed on Sir William R. Smith, Principal of the Institute, and Emeritus Professor of Medical Jurisprudence and Toxicology, King's College, University of London, in recognition of his meritorious services during the past fifty years to the cause of Public Health.

Prof. William Henry Welch.—The Harben Gold Medal of the Royal Institute of Public Health, of the value of fifty guineas, and bestowed triennially upon some person, irrespective of nationality, who has rendered the most eminent services of Public Health, has this year been bestowed on Prof. W. H. Welch, of Johns Hopkins University, Baltimore. Among the distinguished recipients of this honour in the past have been Pasteur, of Paris; Pettenkofer, of Munich; Koch, of Berlin; Sir John Simon, of London; Behring, of Marburg; Kitasato, of Tokio; and Lister, of London. Professor Welch was also the recipient of one of the medals specially struck for the Harveian Society's Centenary Celebration at St. Bartholomew's Hospital, London.

The Pacific Northwest Medical Association met in Seattle, Wash., this year, during the last week in June. Dr. R. B. Gillies, of Vancouver, was elected *President*. Dr. S. E. Lambert, Spokane, was named *First Vice-President;* Dr. W. F. Howard, Pocatello, Idaho, *Second Vice-President*, and Dr. Frederick Epplen, Seattle, was re-elected *Secretary* and *Treasurer* for the ninth successive time.

In 1933 the Association will probably convene in Vancouver.

Dr. J. C. McMillan, of Winnipeg, is attending the meeting of the 3rd International Congress of Radiology at Paris, July 26 to 31. Other Canadians who are there as official delegates are Dr. C. W. Prowd, Vancouver; Dr. G. E. Richards, Toronto; and Dr. J. E. Gendreau, Montreal.

Annual Convention of the American Public Health Association, September 14 to 17, 1931, Montreal (Windsor Hotel).—The 60th annual convention of the American Public Health Association will be held in Montreal, September 14 to 17, 1931. This Association has not met in the Canadian metropolis for 37 years.

The International Society of Medical Officers of Health, the Conference of State Sanitary Engineers, the American Association of School Physicians and the International Association of Dairy and Milk Inspectors will meet immediately preceding or during the convention.

The Health Department of the city of Montreal, in cooperation with the Federal and Provincial Departments of Health and a local committee, are preparing to welcome delegates to Montreal, and are planning for their reception and entertainment, while here, to attend scientific sessions covering every phase of public health and sanitation: public health education, child hygiene, public health nursing, public health engineering, foods, drugs and nutrition, industrial hygiene, vital statistics, epidemiology, laboratory and finally administration, etc., in the section of health officers.

The citizens of Montreal are eager to show their gratitude to the Association for having selected their city for the convention, an international reunion of hygienists, benefiting by the discoveries of science for the prevention and eradication of communicable diseases, the reduction of suffering and the promotion of general welfare.

Physicians, and all those outside of the medical profession interested in public health are cordially invited to attend the different sessions of the convention. Newspapers, with their usual interest in such matters, will publish, no doubt, the program in full and reports of all the papers that will be read during the convention.

Dr. S. Boucher, Director of the Health Department of the city of Montreal, is Chairman of the Local Organization Committee, and Mr. Aimé Cousineau, Engineer, attached to the same department, is the General Secretary.

United States

Spotted Fever in Eastern United States.—Coincident with studies on endemic typhus fever along the Atlantic seaboard, attention was called to the occurrence of a febrile condition, marked by purplish-brown mottling of the skin, malaise, prostration, etc., similar in features to Rocky Mountain spotted fever. Four cases were met with, three in northern Virginia.

Inoculation of guniea-pigs with blood from these cases resulted in establishing three strains of virus, named T., H. and R., respectively. By cross-immunity tests the T and H strains were found to be identical, and the R strain after a short period of cultivation was dropped.

The relationship to the virus of Rocky Mountain spotted fever is such that guinea-pigs surviving infection by T or H strains of the Atlantic coast virus are immune against the virus of Rocky Mountain spotted fever. No evidence of cross-immunity to either European and American typhus virus could be elicited.

As in each of the four human cases recorded, definite evidence of tick bites was obtained, it would appear that a disease similar, if not identical with, Rocky Mountain spotted fever has been identified along the states of the Atlantic seaboard.

Dr. Maud E. Abbott of McGill University spoke to the Medico-Historical Club of the College of Medicine, University of Illinois, on April 8. The subject of the address was "Sir William Osler, biographical outline and personal recollections," and was illustrated with numerous slides.

Dean Davis called attention to the exhibit of Osleriana in the library. This exhibit includes the books written by Osler; the books that Osler particularly admired; the first edition of Cushing's life of Osler, with an autographed photograph of Cushing; numerous photographs of Sir William; also many letters from Sir William, some of them to various members of the faculty.

Book Reviews

Noguchi. Dr. Gustav Eckstein. 400 pages, illustrated. Price $5.00. Published by Musson Book Co., 225 Jarvis Street, Toronto, 1931.

The story of Noguchi's life and work will always possess great interest for the profession. Born in the hill district of Japan, his parents of the farming class and in destitute circumstances, the lad himself, suffering from an unpleasant deformity of his left hand, due to a severe burn in infancy he by his remarkable mental powers, his untiring energy and intense ambition, manifested quite early, attracted the attention of friends and by their assistance surmounted the difficulties connected his obtaining a fair primary education. A successful operation on his hand by a Japanese surgeon decided him to study medicine. His attention was early directed to the schools of America and Germany. By good fortune he met Dr. Simon Flexner in China, during the prevalence of the plague, and on his arrival in America to him he turned. His remarkable ability was recognized and Noguchi was afforded opportunity to work first in the University of Pennsylvania and afterward on the founding of the Rockefeller Institute he was given a position on its staff, where his remarkable success in bacteriological investigation quickly brought him into the limelight.

Shortly after his tragic death in Africa whither he had gone to complete his investigation on the etiology of yellow fever, Dr. Simon Flexner wrote a charming sketch of his life and work which appeared in *Science*.* In the octavo volume before us of 400 pages a much more detailed presentation of Noguchi's life is given, and forms a most interesting story, told in a semi-dramatic way in somewhat jerky, forcible, and imperfect English, such as is used in the Orient. The writer, Dr. Gustav Eckstein, describes himself as having studied medicine, practised dentistry and taught physiology. The amount of incident given is large, and must have involved much diligence in the collection of the details from individuals closely associated with Noguchi. Numerous abstracts from letters of Noguchi to friends are given. It is unfortunate that no references are given and that Dr. Eckstein, neither in a preface nor in connection with any incident makes any statement as to the source of his information. Interesting pictures are given of Japanese manners, and the story of many of his visits to other laboratories are described as if by an associate or eye witness, in which much detail is given and occasionally even Noguchi's exact words.

As described by Dr. Flexner, Noguchi was a man admired for his gifts, and loved for his ingratiating personal qualities. Some of the incidents as portrayed by Dr. Eckstein are by no means of a pleasing character, and without any corroboration of their authenticity will detract from the value of the book for many readers. A.D.B.

* *Science*, 929, **69**: 653.

Diagnosis and Treatment of Heart Disease. E. M. Brockbank, M.D., Hon. Consulting Physician, Royal Infirmary, Manchester. Sixth edition. 256 pages, illustrated. Price 7/6 net. H. K. Lewis & Co., London, 1930.

The subtitle of this small book is "Practical Points for Students and Practitioners". After reading the book one feels that such an explanatory note is necessary. For the most part the style is rather racy and the discussions are brief and sketchy. Certain chapters show an attempt at thoroughness which is out of proportion to the remainder of the book. It would seem that in these chapters the author deals with controversial questions which are of particular interest to himself. Thus the question as to whether the crescendo murmur of mitral stenosis is systolic or pre-systolic in time occupies considerably more space than the general construction of the book would warrant. The author maintains that the murmur is systolic in time, but the evidence in favour of this contention is very indirect and lacks data which might make his argument convincing. The author is to be congratulated on having had the happy thought of devoting a separate chapter to the problem of "The Heart in School Children". This title suggests a discussion of so-called functional murmurs and certain insignificant arhythmias which attract the attention of the school physician. These are only briefly dealt with however, and apparently misplaced discussions on management and prognosis of rheumatic heart disease are included. The question of the care and education of the children who are afflicted with rheumatic heart disease is given little or no attention. In the chapter on Examination for Life Insurance, it is interesting to read that accurate measurement of blood pressure is necessary only in applicants over fifty years of age and in those in whom palpation of the pulse suggests hypertension.

The manner in which this book is written makes its paragraphs attractive for memorizing, but not for reading. As a reference book it has a very limited value because of the brevity and necessary lack of completeness of its matter.

The Alcohol Habit and its Treatment. Walter E. Masters, M.D., M.R.C.S., D.P.H., Medical Superintendent of the Hare Nursing Home, Chislehurst. 190 pages. Price 6/- net. London, H. K. Lewis & Co., 1931.

This little book is contributed by the successor to the late Dr. Francis Hare, with whom the author was closely associated. The views and attitudes of Dr. Hare are evident in the book, but Dr. Masters is to be commended for re-presenting them, enlarging and enriching them from his own ample experience. A very sane attitude characterizes the whole book. The question is dealt with in a plain, matter of fact fashion, free from insistence on any one point of view. The initial chapter

is devoted to a brief historical account of the use of alcohol in its various forms and is followed by a discussion of alcohol as food, drug and poison. No particularly new facts or views are presented. Physiological actions are reviewed and the symptoms of acute and chronic alcoholism detailed. The section on "Causes" is particularly good. To those having much to do with alcoholics, the view of psychological causation is the one that must appeal as most nearly corresponding with the facts, and this is apparently the viewpoint of the author. One by one he cites the popular notions as to why alcohol is used and one by one he disposes of them as excuses and rationalizations. Here and there one finds a sentence or statement with which fault can be found. For instance, "There is no doubt that worry is a more important motive than grief, financial loss or infidelity"—these all seem to include *worry*. But on the whole the exposition is clearly cut and satisfactory.

In discussing treatment a variety of bogus cures are mentioned and exposed. None of these are in evidence in this country. The main principles of treatment are those adopted by anyone having much to do with alcoholics, *viz.*, desire to be cured on the part of the patient, abstinence, search for and removal of causes and physical and mental rehabilitation. The author uses apomorphine, strychnine and various sedatives freely and has a great respect for religious conversion as an aid in treatment. Little is to be found on alcoholism in the usual medical texts. This book has much to recommend it. It covers the subject well, is short, concise and readable, and there is a complete lack of the emotionally inspired inexactitude often noted in such texts.

Medicine in the British Isles. Sir D'Arcy Power, K.B.E., F.R.C.S., Honorary Librarian at Royal College of Surgeons of England, Consulting Surgeon, St. Bartholomew's Hospital, London. Clio Medica Series, No. 2. 84 pages, price $1.50. Paul B. Hoeber, Inc., New York, 1930.

This little volume sketches the history of medicine in the British Isles in a most interesting and instructive manner. It begins with early conditions in Saxon times and traces British Medicine up to the present day. The historical material is cleverly arranged in chapters, each dealing with one aspect of medicine, *viz.*, Hospitals, Nursing, etc. Specially interesting to medical men is the history of medical education and the developments of the medical corporations and societies and their effect upon the profession.

This is a small book that requires very little time in the reading, but which acts as a fine stimulus to one's interest in medical history.

Seasonal Variation in Man. (A theory). Edmund Hughes, M.R.C.S., L.R.C.P. 126 pages, illustrated. 6/- net. H. K. Lewis & Co. Ltd., London, 1931.

The author has formulated an hypothesis as follows: "that human physiology, in common with that of all other mammals, was built up on the expectation of annual inactive periods, that is on the expectation of seasonal sleep, together with what this involves; and that, in a heat-stable mammal, such as man, traces of the chemico-physiological rhythm implied by this may still be present under appropriate physical and other conditions." He suggests that vestigial organs and functions active in the hibernating ancestors of the lineage from which man derives may be fundamental in some pathological states observed in man, *e.g.*, rickets and gout. The changes observed in hibernating animals, *viz.*, among others, the laying on of fat prior to the hibernating period and the reproductive activity that immediately follows the inactive state are paralleled in man. In support of this he cites the growth in height of children during the spring months in northern latitudes followed by an autumnal increase in weight though the height increment is decreased. He further quotes statistics to show that human reproductivity is greater during the late winter and early spring months than in other months of the year.

The book is interesting but the discussion is rather difficult to follow and one feels that though well written the subject could have been more clearly presented.

An Introduction to Practical Bacteriology. A Guide to Bacteriological Laboratory Work. T. J. MacKie, M.D., D.P.H., Professor of Bacteriology, University of Edinburgh, etc., and J. E. McCartney, M.D., D.Sc., Director of Research and Pathological Services, late Metropolitan Asylums Board, London, etc. Third edition. 421 pages. Price $3.00. E. & S. Livingstone, Edinburgh; Macmillan Co. of Canada, Toronto, 1931.

The authors of this work have succeeded admirably in including in their text a very large amount of information essential to the student and quite a satisfactory amount for those engaged in routine laboratory work.

The book deals with bacteria and other lower forms in their relation to human and animal life. In the first chapter the morphology and physiology of micro-organisms is considered particularly with reference to bacteria. A brief reference is made to the classification of bacteria brought forward by the American Society of Bacteriologists. This classification is given in an abbreviated form and has reference to the bacteria dealt with in subsequent chapters. The second chapter discusses, generally and very briefly, immunity in a manner to introduce the subject to the student. A later chapter gives, quite fully for such a small book, the details for the collection of specimens and the technique of commoner serological tests and the making of bacterial vaccines. The use of the microscope, the making of culture media, the cultivation of micro-organisms, and staining methods are dealt with very fully in chapters III, IV and V, covering more than one hundred pages. Chapter VIII gives in fourteen pages the bacteriological laboratory examination of water, milk, sewage and antiseptics. The final chapters IX to XXIII are devoted to the study of the morphology, staining reactions, cultural characteristics and identification of the commoner microörganisms. One chapter discusses the Gram-positive cocci and other organisms associated with the commoner suppurative conditions; another has for its subject matter the Gram-negative cocci. Other chapters deal with the *B. diphtheriæ* and related organisms, the *B. tuberculosis* and other acid-fast bacilli, etc. The chapter dealing with the colon-typhoid group also has a brief discussion of *Entamœba histolytica* and related protozoa. A very good table on p. 302a gives at a glance the biochemical reactions of twenty-four bacteria to which reference has been made in this chapter.

It is not possible nor does it seem necessary to make reference to all the organisms treated. The commoner pathogens and commensals of man and animals are discussed briefly but in sufficient detail for a work of this size. In the later chapters space is given to brief discussion on the anærobes, actinomyces, spirochætes, hyphomycetes and blastomycetes, trypanosomes and filterable viruses. Finally it may be said that this book is well written and contains an abundance of information briefly and tersely given and appears to be very suitable for the purpose for which it was written, *viz.*, for the guidance of undergraduate and post-graduate students, undertaking practical work in the bacteriological laboratory.